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Tests in the four fundamentals of arithmetic.

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A THESIS

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TESTS IN THE FOUR FUNDAMENTALS OF ARITHMETIC

Submitted by

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Chapter I

INTRODUCTION

Introductory Statements

The purpose of this study is to describe the work of the Testing Committee of the Omaha Public Schools in the construction of testing materials in arithmetic. The writer served as a member of this group.

The main objective of the Committee was to design tests in the four fundamentals of arithmetic which will give teachers help in determining the degree of proficiency which individual pupils and classes have attained and to direct follow-up teaching to the specific needs of individual children. Before starting work on the tests, however, research studies were made as to the present day trends in the teaching and testing of arithmetic. This was followed by the construction of the tests and A Teacher's Manual governing their use. An experiment to evaluate the use of the test as a teaching device was then carried on in a normal class room.

The following chapters are descriptions of these three divisions.

Review of Research with Reference to the Teaching and Testing of Arithmetic

The first six meetings of the Committee were given to summarizing the research in arithmetic made by: Rinsland (9), Brueckner (1), Corning (2), The Sixteenth Yearbook (18), Washburne (12), Wilson, Stone, Dalbrymple (13), and Woody and Sangren (14).

There has been an increasing insistence in recent years that questions relating to arithmetic be answered through research reinforced by a large number of special studies. The members of the Committee found a number of these studies to be in complete agreement and many of the researches to be conclusive. With no thought of completely covering the field, a summary of the findings of the present day trends in arithmetic are given here.

In our study we found:

1. That the four fundamental processes make up ninety per cent of adult figuring and therefore should receive first consideration in any program.

2. That multiplication and addition are decidedly the most useful processes. The acquiring of these skills should be accomplished through a step by step process.

3. That systematic drill should be deferred at least to the third grade.

4. That the "traditional" schools have been attempting to train all children's minds, regardless of their capacities, by the same sort of treatment. Individual needs and abilities are being ignored. These needs should be discovered through diagnostic procedures.

5. That in the "activity-experience" schools, where the learning of arithmetic depends in large measure upon the wisdom and judgment of the teacher, a more direct approach is needed to master mathematical processes.

6. That many useless processes previously taught in the elementary schools are being eliminated.

7. That there has come the realization that the drill undertaken should be limited to the few useful processes. This drill must meet individual needs.

8. That the general trend in arithmetic today is toward fuller comprehension and genuine usefulness. Some processes are so useful as to demand perfect mastery.

9. That a program of diagnostic teaching provides for individual instruction.

One conclusion was drawn from these studies. They demonstrated that there is a definite movement toward diagnostic teaching and testing.

The Committee's next problem then, was to investigate the testing programs. The members directed their attention first to available research material on early testing programs.

In a summary of the research relating to early testing R. L. Morton (5) shows that the testing program has often determined the curriculum and methods of teaching. Testing has been in a position of a master

when it should always be in the position of servant. He lists the following common defects of early testing programs:

1. If two or more teachers graded the same paper, and did not confer on the subject, they frequently disagreed markedly as to what the paper was worth.

2. No single test could measure adequately a pupil's grasp of a subject.

3. Sometimes tests were out of harmony with desirable educational objectives.

4. Although the traditional test revealed the fact that a pupil was weak, it failed to show where his weaknesses were.

5. The early testing programs did not take into account relative abilities of children.

6. Tests had a tendency to encourage the cramming of details rather than the understanding of broad principles.

7. Most tests had been made by people dominated by the statistical viewpoint.

Many authors agree that the early testing programs have not given the desired results. A defensible program of testing must discard these fundamental weaknesses. So from this review, the attention of the Committee turned to a consideration of the standards for good tests.

Five questions which experts have agreed upon as most important in arriving at serviceable and straightforward standards for characterizing good tests, as set forth by Woody and Sangren (14) are:

1. Will the use of the test tend to center attention upon a desirable aspect of the teaching of the subject? This is the first and probably the most important of the questions to be asked. In the present stage of development of the testing movement, those who construct tests usually make very careful analyses of the outcomes to be derived from the teaching of the subject and indicate the specific outcomes which the tests are supposed to measure. Furthermore, the content of the test and the method emphasized therein must conform to the prevailing philosophy of education underlying the teaching of the subject.

2. Is the test easily given and easily scored? This question may appear to some as having comparatively little importance, but those experienced in the giving of tests or in the directing of testing programs recognize its importance. Under most conditions, especially if the purpose of the testing program is that of improvement of instruction, teachers with relatively little or no experience with tests or testing techniques must assume responsibility for the giving of tests or for determining correct responses or pupils' scores are possible sources of considerable error and create situations which may develop unfavorable attitudes toward the testing program itself. Tests having few and simple directions are much to be preferred to those containing many and complicated directions. Tests with directions printed on the tests themselves, with adequate sample exercises to make clear to the pupil the nature of the task to be done, are much preferred to those in which directions are explained on supplementary sheets.

   Not only must the test have few simple directions and be easy to administer but also it must be easy to score. The scoring should be objective--i.e., the answer to the different items of the test must have been agreed upon so that all individuals in scoring will attach the same values to similar answers. The objectivity of a test is usually cared for by the preparation of

scoring keys and answer sheets. The success or failure of the giving of any series of tests will depend largely upon the skill with which the tests may be administered and scored.

3. Does the test have high reliability? The reliability of a test means the accuracy with which a test measures what it is supposed to measure. In simple language, it means the degree to which an individual in a group taking a test or a number of comparable forms of a test several times, will achieve the same relative position in the various distributions of scores.

4. Is the test a valid measure of the thing to be measured? The validity of a test refers to the degree with which a test measures what it is supposed to measure. The phrase "measures what it is supposed to measure" means that a valid test contains items which are of prime importance and which in a way constitute a sampling of what might be termed the minimum essentials of the subject. Some writers insist that the definition of validity should read: "The degree with which a test measures what it is supposed to measure, and at the same time measures nothing else."

5. Does the test provide for individual differences? Individuals differ in the amount and type of their learnings. Individual differences make every child a special problem. The test must cover the objectives specified in individualized teaching, that is, it must gauge the extent of learning and determine the practice and reteaching needed by each individual student.

With these questions in mind the Committee examined a number of standard tests. It was found that many so-called diagnostic tests on the market today do not really diagnose. They merely point out whether a student's difficulty is with addition or subtraction, and in some instances they show in what type of example

the difficulty lies. They do not, however, test the pupil's ability to handle the many skills which must be employed in performing each of these operations. A diagnostic test should determine which skills each pupil has failed to master. No standard tests were found that would analyze difficulties, locate specifically the individual needs and provide for reteaching. Therefore, the Committee proceeded to construct its own battery of tests covering the four fundamental processes in arithmetic.

Chapter II

THE CONSTRUCTION OF THE DIAGNOSTIC TESTS

There are many kinds of tests. The Committee decided to confine its attention to the construction of diagnostic tests covering the specific skills involved in the fundamental processes in arithmetic. These specific skills are not the discovery of the committee. They have been set forth by experts in the field of arithmetic on the basis of research studies. A thorough study and analysis of these specific skills was made. A summarization of this analysis is presented here to illustrate the broad basis upon which the Committee built the diagnostic material.

Addition

1. The primary facts
2. Higher decade facts
3. One column addition with and without zeros
4. Two and three place addends
5. Multiple place addends, with gaps and zeros
6. Carrying and column addition
7. Carrying with gaps and zeros

Subtraction

1. Primary facts
2. Upper decade facts
3. Simple subtraction without borrowing or adjusting
4. Simple subtraction with last subtraction a zero not brought down
5. Subtraction with gaps
6. One step adjusting
7. Double adjusting

Multiplication

1. Primary facts and reverses
2. One place multiplier - no carrying
3. One place multiplier - carrying requiring addition in same decade
4. One place multiplier - carrying to higher decade
5. Zero in multiplicand - with and without carrying to the zero
6. Two and three place multiplier - no carrying
7. Two and three place multiplier with carrying
8. Zero in multiplier

Short Division

1. Primary even facts
2. Primary uneven facts
3. Division - no remainders or carrying
4. Division with remainders - no carrying
5. Division with carrying - no remainders
6. Division with carrying and remainders

Long Division

1. Two-place divisor, no carrying in the multiplication, no adjusting in the subtraction, no remainders
2. Two-place divisor, three and four-place dividend, no carrying or borrowing, some remainders
3. First partial divident requiring one more digit than the divisor contains, no carrying or borrowing, some remainders.

4. Larger right-hand figure in the divisor, carrying in the multiplication, some remainders.

5. Borrowing in the subtraction - no carrying in the multiplication

6. Carrying in the multiplication and borrowing in the subtraction

7. Easy examples with more than two figures in the divisor

8. Zero in the dividend

9. Zero in the quotient

10. When the trial quotient is not the true quotient

After the study of these skills the Committee planned to construct several forms of tests for each specific skill; all of which were to be of comparable difficulty. It was planned that these forms would be used by the teacher to chart the progress which the pupils would make in the development of each skill.

Before starting work on these forms, however, the Committee set up the following objectives for the tests; based on the five questions which characterize good tests. These questions, formulated by the authorities, Woody and Sangren (14), were discussed in the previous chapter of this thesis.

1. Does the test tend to center attention upon a desirable aspect of the teaching of the subject?

With this adequate program of tests to be used during teaching, the difficulties in arithmetic can be checked so promptly that they will be corrected during the original teaching procedure rather than allowed to accumulate for

remedial work and this is most desirable

2. Is the test easily given and easily scored?

   On each test sheet will be printed a few simple Directions to Pupils with two examples. Example "A" which has been worked and Example "B" which the pupil is to work before starting the test proper. Scoring keys will accompany each test.

3. Does the test have high reliability?

   Four comparable forms (Form A - Form B - Form C - Form D) for each test will accurately determine the pupil's ability.

4. Is the test a valid measure of the thing to be measured?

   Each test will measure only one specific skill

5. Does the test provide for individual differences?

   The tests will gauge each individual's deficiencies and excellencies.

Four forms of tests for each specific skill were to be constructed. First, the process in addition was handled in the following manner:

ADDITION

Test I: The Primary Facts

There are one hundred basic number facts in addition. Knowledge of the number of addition facts has come by a slow process of evolution. The first idea with reference to primary addition facts was that there were forty-five of them. Each digit, 1, 2, 3, etc., was placed down, and underneath was placed each of the other digits. These became known as the Forty-five Direct Facts.

Direct Facts

1	1	1	1	1	1	1	1	1
1	2	3	4	5	6	7	8	9
2	2	2	2	2	2	2	2	
2	3	4	5	6	7	8	9	
3	3	3	3	3	3	3		
3	4	5	6	7	8	9		
4	4	4	4	4	4			
4	5	6	7	8	9			
5	5	5	5	5				
5	6	7	8	9				
6	6	6	6					
6	7	8	9					
7	7	7						
7	8	9						
8	8							
8	9							
9								
9								

As the study of primary facts continued, it was soon realized that knowledge of the direct form did not always ensure knowledge of the reversed form. Of the forty-five direct facts, all except the doubles can be reversed. There are thirty-six reverses:

The Reverses

2	3	4	5	6	7	8	9
1	1	1	1	1	1	1	1
3	4	5	6	7	8	9	
2	2	2	2	2	2	2	
4	5	6	7	8	9		
3	3	3	3	3	3		
5	6	7	8	9			
4	4	4	4	4			
6	7	8	9				
5	5	5	5				
7	8	9					
6	6	6					
8	9						
7	7						
9							
8							

These thirty-six added to the forty-five gave a total of eighty-one combinations. When attention was finally directed to zeros, there was a prompt realization that here was a phase of the work quite neglected and very much in need of attention. The zero combinations with their reverses are as follows:

Zero Facts

0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9

The Reverses

1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0

These nineteen zero facts added to the eighty-one combinations make the total one hundred primary addition facts which the pupil must learn. Weakness in knowledge of these number facts results in inaccurate work in the application of the addition process.

In making a diagnosis of the arithmetic skills, one of the first steps should be to determine the pupil's knowledge of these basic combinations. To help the teacher diagnose this specific skill, the Committee divided the one hundred combinations into four forms. In each form there are twenty-five facts with an even distribution of the direct facts, the reverse facts, and the zero facts in the following arrangement:

Form A	Form B
11 direct facts	11 direct facts
9 reverse facts	9 reverse facts
5 zero facts	5 zero facts
25 in Form A	25 in Form B

Form C	Form D
11 direct facts	12 direct facts
9 reverse facts	9 reverse facts
5 zero facts	4 zero facts
25 in Form C	25 in Form D

Copies of these four forms of Test I may be found in the appendix.

Test II and Test III: Higher Decade Facts

The higher decade facts, which combine one-place numbers with two-place numbers, are needed in column addition and also for carrying in multiplication. The decade facts are related to the primary facts. For instance, the primary fact - 1 plus 2 - has the related decade facts 11 plus 2, 21 plus 2, 31 plus 2, etc. There are three hundred and eighty upper decade facts. There is no experimental evidence available which would justify the conclusion that all of these combinations must be practiced. Curriculum investigations have shown that long addition examples involving sums as large as 60 or 70 in the addition of columns occur very rarely in life. It has, therefore, appeared adequate according to Wilson, Stone, and Dalrymple (13), to limit the work in decade facts through the fact 39 plus 9, as the other facts are beyond social usage; such, for example as 79 plus 8. There are then 270 decade facts which are used most frequently.

These facts are:

10 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

11 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

12 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

13 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

14 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

15 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

16 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

17 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

18 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

19 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

20 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

21 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

22 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

23 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

24 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

25 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

26 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

27 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

28 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

29 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

30 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

31 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

32 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

33 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

34 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

35 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

36 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

37 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

38 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

39 plus 1, 2, 3, 4, 5, 6, 7, 8, 9

In addition to these facts carried to 39 plus 9 which are needed for the process of addition, there are 80 facts above 39 plus 9 needed for carrying in multiplication. They are:

40 plus 1, 2, 3, 4, 5, 6, 7

42 plus 1, 2, 3, 4, 5, 6

45 plus 1, 2, 3, 4, 5, 6, 7, 8

48 plus 1, 2, 3, 4, 5, 6, 7

49 plus 1, 2, 3, 4, 5, 6

54 plus 1, 2, 3, 4, 5, 6, 7, 8

56 plus 1, 2, 3, 4, 5, 6, 7

63 plus 1, 2, 3, 4, 5, 6, 7, 8

64 plus 1, 2, 3, 4, 5, 6, 7

72 plus 1, 2, 3, 4, 5, 6, 7, 8

81 plus 1, 2, 3, 4, 5, 6, 7, 8

These 80 addition facts are very essential for carrying in multiplication and should be mastered perfectly.

The Committee divided the higher decade facts into two tests:

Test II: Decade Facts Needed in Addition

This test has two forms (Form A and Form B) Into each form were put fifty of the higher decade facts needed in column addition.

Copies of these forms may be found in the appendix.

Test III: Decade Facts Needed in Multiplication

This test has two forms (Form A and Form B). The Committee divided the 80 decade facts needed in multiplication into 40 facts for each form.

Copies of these two forms may be found in the appendix.

Test IV: Single Column Addition

The problems of the single column addition test are based on the primary and higher decade facts. For example the problem 6 plus 8 plus 7, contains the primary fact 7 plus 8, and then the higher decade fact 15 plus 6.

The Committee made two large charts. Chart I contained the 100 primary facts. Chart II contained the 270 higher decade facts. As a primary or decade fact was used in building a problem, a line was put through this fact on the chart indicating it had been used. By means of this device it was made certain that all the facts were used and that no one fact was over used. Four forms for this test were constructed with twenty-five problems in each form.

Copies of these four forms may be found in the appendix.

Test V: Two and Three Place Addends

The problems of this test are based upon the facts used in the previous tests - the primary facts and the higher decade facts - but carries them into two and three place addends. The facts whose sums are greater than "9" occur only in the left hand column of the example, as:

670	80	442
712	52	851
413	51	801

Again two large charts, one containing the primary facts and the second composed of the higher decade facts, were used as in Test IV, to make certain that each fact was used and that none were over used. Four forms of this test were constructed with twenty problems in each form.

Copies of these four forms of Test V may be found in the appendix.

Test VII: Multiple Place Addends with Carrying

Test VII involves the new step carrying, but the sum of the left-hand column is not more than 10. Note the following examples:

262	25	540
33	232	142
119	33	93
	119	42

In building the problems for this test the same procedure that was used in forming the problems for

the previous tests was followed, adding the new skill carrying. There is carrying from the first column to the second column and from the second column to the third. The sum of the final column is kept below 10. Four forms with twenty problems in each form were constructed.

Copies of the four forms of Test VII may be found in the appendix.

Test VIII: Column Addition with Carrying and Gaps

This is the final test in addition. It is an extension of the previous steps. The new point is that the sum of the final column is not kept below 10. In building the problems, all the difficulties that had been previously checked on in the preceding seven tests were included. The primary and higher decade facts were used, adding to them the skills of carrying and gaps.

The following is an illustration:

```
 912
 141
  80
  16
----
```

Four forms of this test with twenty problems in each form were constructed.

The four forms of this test may be found in the appendix.

SUBTRACTION

Subtraction ability is a composite of many skills. One must know the primary facts, must know the higher decade facts, must know what to do with zeros, must be able to "adjust" or "borrow", and must be able to solve examples in which the subtrahend has fewer digits than the minuend. To help the teachers guide pupils in the acquiring of subtraction ability, the Committee constructed six tests. The first was a test on the basic subtraction facts.

Test IX: Primary Subtraction Facts

There are one-hundred primary subtraction facts. A knowledge of these facts is absolutely essential for satisfactory work in the process of subtraction. These facts are given on the following page.

The Primary Subtraction Facts

0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0
1	2	3	4	5	6	7	8	9	10
1	1	1	1	1	1	1	1	1	1
2	3	4	5	6	7	8	9	10	11
2	2	2	2	2	2	2	2	2	2
3	4	5	6	7	8	9	10	11	12
3	3	3	3	3	3	3	3	3	3
4	5	6	7	8	9	10	11	12	13
4	4	4	4	4	4	4	4	4	4
5	6	7	8	9	10	11	12	13	14
5	5	5	5	5	5	5	5	5	5
6	7	8	9	10	11	12	13	14	15
6	6	6	6	6	6	6	6	6	6
7	8	9	10	11	12	13	14	15	16
7	7	7	7	7	7	7	7	7	7
8	9	10	11	12	13	14	15	16	17
8	8	8	8	8	8	8	8	8	8
9	10	11	12	13	14	15	16	17	18
9	9	9	9	9	9	9	9	9	9

So that the forms A, B, C, and D of this test would be comparable the Committee first divided the one hundred facts into these groups:

44 facts whose minuend is 10 or less as: $\begin{array}{r} 9 \\ -4 \end{array}$

36 facts whose minuend is over 10 as: $\begin{array}{r} 15 \\ -6 \end{array}$

10 facts with zero remainders as: $\begin{array}{r} 8 \\ -8 \end{array}$

10 facts with zero subtrahend as: $\begin{array}{r} 5 \\ -0 \end{array}$

An even distribution of the above facts was put into each form of the test.

Form A	Form B
11 facts minuend 10 or less	11 facts minuend 10 or less
9 facts minuend over 10	9 facts minuend over 10
2 facts zero remainders	3 facts zero remainders
3 facts zero subtrahend	2 facts zero subtrahend
25 facts	25 facts

Form C	Form D
11 facts minuend 10 or less	11 facts minuend 10 or less
9 facts minuend over 10	9 facts minuend over 10
2 facts zero remainders	3 facts zero remainders
3 facts zero subtrahend	2 facts zero subtrahend
25 facts	25 facts

Copies of the four forms of Text IX may be found in the appendix.

Text X: Higher Decade Subtraction Facts

The solution of any example by a borrowing method requires only primary subtraction facts.

In the example: 6 1 4 6 the facts needed are:
3 2 9 7

16 13 10 5
7 9 2 3. If, however, the example were solved by an equal-additions method, the facts needed are:

16 14 11 6
7 10 3 4. It is thus seen that there will be a possible need for taking 10 from 10 and the subsequent numbers through 19. These are the only upper decade facts needed for subtraction examples.

Upper decade subtraction facts are needed in short division as the following example shows:

$5\overline{)1925}^{385}$. In this example, one must subtract mentally

19 and 42
15 40.

There are 175 such subtraction facts needed for short division with divisors from 2 through 9. These facts follow:

11	12	13	14				
10	10	10	10				
13	14	15	16	17			
12	12	12	12	12			
15	16	17	18	19	20		
14	14	14	14	14	14		
16	17	18	19				
15	15	15	15				
17	18	19	20	21	22	23	
16	16	16	16	16	16	16	
19	20	21	22	23	24	25	26
18	18	18	18	18	18	18	18
21	22	23	24				
20	20	20	20				
22	23	24	25	26	27		
21	21	21	21	21	21		
25	26	27	28	29	30	31	
24	24	24	24	24	24	24	
26	27	28	29				
25	25	25	25				
28	29	30	31	32	33	34	35
27	27	27	27	27	27	27	27
29	30	31	32	33	34		
28	28	28	28	28	28		

31	32	33	34				
30	30	30	30				
33	34	35	36	37	38	39	
32	32	32	32	32	32	32	
36	37	38	39	40	41		
35	35	35	35	35	35		
37	38	39	40	41	42	43	44
36	36	36	36	36	36	36	36
41	42	43	44	45	46	47	
40	40	40	40	40	40	40	
43	44	45	46	47	48		
42	42	42	42	42	42		
46	47	48	49	50	51	52	53
45	45	45	45	45	45	45	45
49	50	51	52	53	54	55	
48	48	48	48	48	48	48	
50	51	52	53	54	55		
49	49	49	49	49	49		
55	56	57	58	59	60	61	62
54	54	54	54	54	54	54	54
57	58	59	60	61	62	63	
56	56	56	56	56	56	56	
64	65	66	67	68	69	70	71
63	63	63	63	63	63	63	63
65	66	67	68	69	70	71	
64	64	64	64	64	64	64	
73	74	75	76	77	78	79	80
72	72	72	72	72	72	72	72
82	83	84	85	86	87	88	89
81	81	81	81	81	81	81	81

These 175 facts were divided into the four forms of Test X with 44 facts in each form.

Copies of these four forms may be found in the appendix.

Test XI: Simple Subtraction

In working the problems of this test simple subtraction is required. By simple subtraction is meant no borrowing (adjusting) is necessary. The problems are based on the one hundred primary facts with one new skill--the last subtraction, a zero, is not brought down, as the following examples show:

294	593	8036
281	570	8010

As each primary fact was used in forming a test problem, it was marked "used" on a chart. In this manner it was made certain that all the facts were being used. Twenty problems were put into each form of the test.

Copies of the four forms of this test may be found in the appendix.

Test XII: Simple Subtraction With Gaps

The problems in this test use the same facts as the previous tests adding one new skill, gaps. Gaps are confusing to children and need attention. The examples, again, were constructed so as to include each of the 100 subtraction facts:

799	2908	5728	1656
85	104	500	412

Four forms, each containing twenty-five problems, were built for this test.

The tests may be found in the appendix.

Test XIII: One Step Adjusting

The skill of adjustment is needed when a subtraction example contains a minuend figure that is smaller than the corresponding subtrahend figure. The problems in this test make provision for checking on this skill. The Omaha Schools use the "additive" method in adjusting. The examples of the test are based on the one hundred subtraction facts using the "additive" method in one step. Following is an example:

```
576   8 and what are 16,
248   5 and what are 7, 2 (adjusting)
      2 and what are 5, 3
```

To make certain that each fact was being used, a chart containing the primary facts was again used while building the examples. There are twenty-five examples in each of the four forms of the test. Copies of the tests may be found in the appendix.

Test XIV: Double Adjusting

This test is an extension of the previous test, carrying the adjustment into two steps, as:

```
        7 and what are 13, 6
 4283   5 and what are  8, 3 (adjusting)
-2647   6 and what are 12, 6
        3 and what are  4, 1 (adjusting)
```

Four forms of the test were built with fifteen examples in each form. Copies of these four forms of Test XIV may be found in the appendix.

MULTIPLICATION

There is in this country, a long and firmly established custom of teaching combinations to twelve times twelve. This custom, which seems to be English in origin, has little to be said in its defense. When we multiply a number by 10, as: 128 x 10 we do so by annexing a zero, not by thinking ten 8's, ten 2's, etc. There are only a few persons who have learned the tables of 11's and 12's, that multiply by 11 and 12 as single multipliers. The most common solution for 42 x 12 is:

$$\begin{array}{r} 42 \\ \times 12 \\ \hline 84 \\ 42 \\ \hline 504 \end{array}$$

Few will multiply using twelve 2's, and twelve 4's. The elimination of the 10, 11 and 12 facts is justifiable because so few persons use these forms. The schools of today are teaching one-hundred primary facts in multiplication:

1	1	1	1	1	1	1	1	1
1	2	3	4	5	6	7	8	9
2	2	2	2	2	2	2	2	2
1	2	3	4	5	6	7	8	9
3	3	3	3	3	3	3	3	3
1	2	3	4	5	6	7	8	9

4	4	4	4	4	4	4	4	4	
1	2	3	4	5	6	7	8	9	
5	5	5	5	5	5	5	5	5	
1	2	3	4	5	6	7	8	9	
6	6	6	6	6	6	6	6	6	
1	2	3	4	5	6	7	8	9	
7	7	7	7	7	7	7	7	7	
1	2	3	4	5	6	7	8	9	
8	8	8	8	8	8	8	8	8	
1	2	3	4	5	6	7	8	9	
9	9	9	9	9	9	9	9	9	
1	2	3	4	5	6	7	8	9	
0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9
9	8	7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0	0	0

Test XV: Primary Facts

The Committee divided the one hundred primary facts into four forms of tests, with twenty-five facts in each form. There is an even distribution of direct facts, of reverses and zero facts included in each form.

Form A

12 direct facts
9 reverses
4 zero facts
25 facts

Form B

11 direct facts
9 reverses
5 zero facts
25 facts

Form C

11 direct facts
9 reverses
5 zero facts
25 facts

Form D

11 direct facts
9 reverses
5 zero facts
25 facts

Copies of this test may be found in appendix.

Test XVI: One Place Multiplier

This test is based on the primary multiplication facts, but the multiplicand is a two or three place number. The multiplier is a one place number. Care had to be taken in building these examples from the primary multiplication chart so that no fact was used that would require carrying, as:

	Primary Facts Used
210 x5	(0 1 2) (5 5 5)
82 x2	(2 8) (2 2)
311 x9	(1 1 3) (9 9 9)

Four forms, with twenty-five problems in each form, were constructed for this test. Copies of this test may be found in the appendix.

Test XVII: One Place Multiplier - Carrying

897
x6

When a pupil works an example of such a type as the one at the left, carrying is involved. This process seems quite complicated for the pupil. It can be made a great deal easier if the 80 higher decade facts in addition are mastered first. These facts were tested in Test III of the Addition Tests. They are again emphasized in this test, as follows:

897 x6

7
6 (primary multiplication fact)

9
6 (54 plus 4, higher decade addition fact)

8
6 (48 plus 5, higher decade addition fact)

In building the examples for this test, two charts were used, one chart containing the primary multiplication facts, the second containing the eighty higher decade addition facts.

Four forms with twenty examples in each were constructed for this test. Copies may be found in the appendix.

Test XVIII: Zero in the Multiplicand

The new skill involved in the problems of this test is the zero in the multiplicand. There is carrying to the zero in some of the examples. The Committee placed the zero in alternate places, as follows:

A. 510 x95 zero at the end, no carrying

B. 206 x6 Middle zero; carrying

C. 4007 x8 Double zero; carrying

D. 4080 x9 Alternate zero; carrying

The examples of this test are based on the primary multiplication facts. Four forms were constructed

with twenty problems in each. Into each form were put the following arrangement of the zero skill:

5 problems having zero at the end of multiplicand; no carrying

5 problems having middle zero; carrying

5 problems having double zero; carrying

5 problems having alternate zero; carrying

Copies of these forms may be found in the appendix.

Test XIX: Two and Three Place Multipliers

The examples of this test contain the new skill, multiplication by two and three digit numbers. Heretofore, the pupil has not multiplied by a number in any position other than unit's place. Now he must place the second and third partial products correctly. The first multiplication step is a familiar one. The second step is the skill ofplacing the first number of the second partial product in the ten's place. The third step is the skill of placing the first number of the third partial product in the hundred's place.

In building the examples the Committee used the basic multiplication facts, omitting those that would lead to carrying. Zeros were used in the multiplicand, as shown by the following:

510	701	632	200
x95	x212	x31	x222

These zero facts had been met before. Four forms with twenty problems in each form were constructed. Copies of the four forms may be found in the appendix.

Test XX: Two and Three Place Multipliers - Carrying

This test is an extension of the previous test, multiplication by two and three place multipliers, with the skill of carrying added. The Committee based the examples on the one-hundred primary multiplication facts, introducing into the examples previously tested skills (two and three place multipliers, zero in the multiplicand) with carrying.

Four forms with twenty problems in each form were constructed. Copies of these forms may be found in the appendix.

Text XXI: Zeros in the Multiplicand and Multiplier

This test contains the new skill, zeros in the multiplier, as:

7183	9305
x80	x504

The zero must be "brought down" into the ten's or hundred's place. In constructing the examples, the Committee again used the basic facts and included all other skills; two and three place multipliers, zeros in the multiplicand and carrying. There are four forms of this test with ten problems in each form.

Copies of these forms may be found in the appendix.

SHORT DIVISION

There are 90 primary even division facts in short division, not one hundred as in addition, subtraction and multiplication. This is because zero as a divisor is not used. The ninety primary even, short-division facts follow:

1)0 1)1 1)2 1)3 1)4 1)5 1)6
1)7 1)8 1)9

2)0 2)2 2)4 2)6 2)8 2)10 2)12
2)14 2)16 2)18

3)0 3)3 3)6 3)9 3)12 3)15 3)18
3)21 3)24 3)27

4)0 4)4 4)8 4)12 4)16 4)20 4)24
4)28 4)32 4)36

5)0 5)5 5)10 5)15 5)20 5)25 5)30
5)35 5)40 5)45

6)0 6)6 6)12 6)18 6)24 6)30 6)36
6)42 6)48 6)54

7)0 7)7 7)14 7)21 7)28 7)35 7)42
7)49 7)56 7)63

8)0 8)8 8)16 8)24 8)32 8)40 8)48
8)56 8)64 8)72

9)0 9)9 9)18 9)27 9)36 9)45 9)54
9)63 9)72 9)81

In addition to the 90 primary even division facts, there are 360 uneven division combinations in which there are remainders. These facts may be found as follows:

		Total Possible
2	into any number from 0 to 19 except those evenly divisible by 2	10
3	into any number from 0 to 29 except those evenly divisible by 3	20
4	into any number from 0 to 39 except those evenly divisible by 4	30
5	into any number from 0 to 49 except those evenly divisible by 5	40
6	into any number from 0 to 59 except those evenly divisible by 6	50
7	into any number from 0 to 69 except those evenly divisible by 7	60
8	into any number from 0 to 79 except those evenly divisible by 8	70
9	into any number from 0 to 89 except those evenly divisible by 9	80
	Total	360

Both the even and uneven facts are used in short-division. Primary uneven division facts occur whenever there is a remainder, to be written as such

or to be carried. These examples, $3\overline{)115}$, $5\overline{)228}$ show the need for primary uneven division facts, the facts being, $3\overline{)1}$ $3\overline{)11}$ $3\overline{)25}$ $5\overline{)22}$ $5\overline{)28}$

Test XXII: Primary Even and Uneven Facts of Short Division

This test affords a convenient means of checking up on the pupils' knowledge of the basic 450 division facts. Into four forms the Committee put a random grouping of 100 of these basic facts. Twenty-five facts were put into each of the four forms.

Copies of the four forms may be found in the appendix.

Test XXIII: Short Division - No carrying - With Remainders

The examples of this test involve the skill of remainders at the end, as:

$2\overline{)47}$ 23 R-1 $\qquad$ $3\overline{)368}$ 122 R-2

In constructing the examples the Committee used the basic primary facts, using care so that no problem required carrying. Four forms with twenty examples in each were made.

Copies of these four forms may be found in the appendix.

Test XXIV: Short Division - Carrying and Remainders

The new skill used in the examples of this test is carrying. Since there is carrying in each step of the example, remainders appear at the end of the examples, such as:

$$2\overline{)511}\ 255\ \text{R-1} \qquad 4\overline{)971}\ 242\ \text{R-3}$$

This test provides a thorough review of all of the uneven basic division facts. In constructing the examples the Committee used a chart of the uneven facts so that as many as possible of the 360 facts were used.

Four forms containing fifteen examples in each form were made.

Copies of these four forms may be found in the appendix.

LONG DIVISION

It has been stated that division is the most difficult of the fundamental operations but that it can be made easier by careful planning based on a thorough understanding of addition, subtraction and multiplication. But unless the examples in long division are so graded that success is possible from the first, no plan for procedure can succeed. The step-by-step plan followed by the Committee begins with a test containing examples having one digit divisors. Examples in the second test represent a slight step forward when remainders are introduced. Carrying is the skill brought into the examples of the third test. The test with examples having zeros in the dividend represents the next forward step. The new type of skill tested in the examples of the test that follows is zeros in the quotient. The last test contains more complicated long division examples when the skill involving the trial quotient is included.

Test XXV: Long Division - No Carrying, No Adjusting, No Remainders

In building the examples for this test, the Committee has made each divisor a two digit number with

the right hand figure a 1 or 2. Each of the eighteen two digit numbers ending in 1 or 2 is used as a divisor. (11-12-21-22-31-32-41-42-51-52-61-62-71-72-81-82-91-92)

The dividends were chosen so that there is no adjusting and no remainders as:

11)121 21)441 31)651

Four forms were constructed for this test with fifteen examples in each form.

Copies of the four forms may be found in the appendix.

Test XXVI: Long Division, No Adjusting, No Carrying, Some Remainders

The only new skill the Committee introduced into the examples of this test is remainders. As in the preceding test the two-digit divisor ends in a 1 or 2. The three place dividends were chosen so that there are remainders as:

```
      12  R-3
41 ) 495
     41
     85
     82
      3
```

Four forms with fifteen examples in each form were constructed.

Copies of the four forms may be found in the appendix.

Test XXVII: Long Division - First Partial Dividend Requiring One More Digit Than the Divisor

In the examples of this test the new skill is, when the first partial dividend requires one more digit than the divisor as:

61)1281 51)1127 82)1886

The Committee again used two place divisors ending in 1 or 2. There is no carrying or adjusting, but some of the examples have remainders.

Four forms with twenty problems in each form were constructed.

Copies of the four forms may be found in the appendix.

Test XXVIII: Long Division - Carrying in the Multiplication

The examples of this test contain the new skill--carrying in the multiplication. The Committee used larger right hand figures in the divisors. The figures of the dividends are so arranged that there are remainders in each problem.

Four forms with fifteen problems in each form were constructed.

Copies of these four forms may be found in the appendix.

Test XXIX: Long Division - Carrying in the Multiplication, Adjusting in the Subtraction

The examples of this test have the combined skills--carrying in the multiplication and adjusting in the subtraction. The Committee used two-digit divisors with the right hand figure of the divisor a large number. The figures of the dividend were chosen so that both carrying and adjusting are needed.

Four forms with twenty examples in each form were constructed.

Copies of the four forms may be found in the appendix.

Test XXX: Long Division - Zero in Dividend

The new skill introduced in the examples of this test is the zero in the dividend. The Committee used the zero in different places; as:

28)$\overline{408}$ 63)$\overline{780}$ 36)$\overline{400}$

The divisors are two-digit numbers and there is carrying, adjusting and remainders in the examples.

Four forms with fifteen examples in each form were constructed.

Copies of the four forms may be found in the appendix.

Test XXXI: Long Division - Zero in Quotient

* The examples of this test were constructed so that zeros occur in the quotients. The Committee used three-digit divisors and arranged the dividends so that the zeros would occur as the second quotient figure in five of the examples, as the third quotient figure in five of the examples, and as the second and third quotient figure in five of the examples. There is carrying in the multiplication, adjusting in the subtraction, and some remainders.

Four forms with fifteen examples in each form were constructed.

Copies of these four forms may be found in the appendix.

Text XXXII: Long Division - When the Trial Quotient is not the True Quotient

The pupil faces the problem, in these examples, of first estimating the quotient and then checking his estimate by mental multiplication. He must repeat this checking until he has found the correct quotient figure. The Committee used two digit divisors and arranged the figures of the dividend so that the trial quotient is not the true quotient as noted in these examples: $49\overline{)1065}$ $88\overline{)2182}$ $37\overline{)1650}$

Four forms with fifteen problems in each form were constructed. Copies of these four forms may be found in the appendix.

When the construction of the battery of tests was completed, the tests were used in a number of schools to establish the time allotment. The timing for each test is given in the Teacher's Manual.

Chapter III

A TEACHER'S MANUAL

When the construction of the battery of tests covering the four fundamentals was completed, the Committee prepared A Teacher's Manual governing the use of the tests.

The following purposes of the tests are listed in the manual:

Specific Purposes of the Tests

1. To discover how well pupils in the elementary schools are learning the fundamental processes in arithmetic.
2. To discover exactly which elementary pupils are having difficulty in using the skills in arithmetic.
3. To help elementary pupils discover their own difficulties and to provide a basis for them to chart improvement.
4. To aid the teachers in knowing where special practice and reteaching is necessary.
5. To give children practice in taking tests under favorable conditions in order that correct attitudes toward tests may develop.

To assure valid results the following instructions in administering the tests are given in the manual:

Administering the Tests

1. Give children clear directions about taking the test. All reasonable questions should be answered before the signal to begin is given.

2. See that children have at least two sharpened pencils before beginning work on the test.

3. When the signal to begin has been given no questions should be asked or answered.

4. All computative work should be done on the test paper. Children should understand that they may use the margins if needed.

5. Do not emphasize the time factor to children. They should be told to work as rapidly and accurately as possible.

6. At the beginning of the test be sure that those children who finish early have something to do which will not disturb those who have not yet finished.

7. Avoid all interruptions. Place a card saying, "Do Not Disturb - Testing" outside the door.

8. Plan the time carefully for giving the test, being sure that children are rested and alert. Avoid giving the test immediately after the recess or physical education periods, or when children are unusually excited.

9. Do not make the test seem overly important to children. Do everything possible to develop a favorable attitude on the part of the children.

10. Follow the time allotment exactly.

If the test is to be a valid measurement of pupil accomplishment, this standard scoring procedure listed in the manual must be followed.

Scoring the Test

1. Follow the scoring key exactly.

2. Do not allow partial credit on any single test item.

3. Place an X in the scoring box for each item missed. Place an O under each item omitted.

4. At the top of the test place the number of items computed correctly (raw score) and under this place the total number of items in the test.

5. When denominate numbers, decimals, fractions, etc., are called for they should be written exactly as they are in the scoring key before credit is given.

The following suggestions are offered in the manual as help to teachers in analyzing the results obtained from this test.

Analyzing the Test Results

1. Fill in the item analysis form which gives for each pupil taking the test the particular problems missed.

2. List those test items where most errors occur in order to discover what difficulties children are having.

3. Select those children who need further instruction in this particular skill tested.

4. Exempt those children who are letter perfect on the test from further instruction on the skill.

5. Form a group composed of those children who need further instruction in a particular skill. Sometime later give another form of the same test to all pupils and compare the results with those of the first test in order to find:

a. Which children have overcome their initial difficulties

b. Which children still require further instruction

c. Which children may have lost the skill to some extent and who need freshening up.

Time Allotment

The tentative time allotment is given for each test in the manual.

These suggestions for planning additional instruction are given in the manual:

Planning Additional Instruction

1. Use a variety of methods of presenting the skill in orderto build up children's understanding and meaning

2. Watch out for physical and emotional defects such as:

   a. Poor penmanship
   b. Lack of sustained effort
   c. Poor eyesight
   d. Poor hearing
   e. Unusual formation of numbers
   f. Poor attitude toward testing.

The construction of the tests and the writing of the manual consumed the work of the Committee for one year.

Chapter IV

EXPERIMENTING WITH THE COMMITTEE'S TESTS ON THE FOUR FUNDAMENTALS

The desire to discover, by means of the Committee's tests, how well each pupil had learned the fundamental processes and where special practice and reteaching were necessary prompted the writer to experiment with the tests immediately upon their arrival at our school building. Since the class was a group of thirty-two seventh and eighth grade pupils who had been taught all the skills of the processes in previous classes, it was thought advisable to use the last test of each process as a survey test. The problems of these final tests contain a combination of all the process difficulties. The tests were given in the following order:

February 9, 1944: Form A of Test VIII (Column Addition with Carrying, Gaps and Zeros) was given to provide a picture of the status of the class in addition.

February 10, 1944: Form A of Test XIV (Double Borrowing) was given to establish the pupils' status as to subtraction at this time.

February 11, 1944: Form A of Test XX (Two or Three Place Multipliers with Carrying) was given to determine the pupils' ability, at this point, in multiplication.

February 14, 1944: Form A of Test XXIX (Division with Carrying in Multiplication, Some Remainders) was administered to establish the students' standing in division.

After the tests were checked by pupils and rechecked by the teacher the scores were tabulated as shown by the following class record sheets:

CLASS RECORD OF ADDITION

Test VIII - Form A

Number of Problems: 20

Date Given: February 9, 1944

Number of Problems Correct	Number of Pupils Receiving Score
20	3
19	2
18	5
17	3
16	4
15	4
14	0
13	0
12	3
11	1
10	3
9	3
8	1
7	0
6	0
5	0
4	0
3	0
2	0
1	0

CLASS RECORD OF SUBTRACTION

Test XV - Form A

Number of Problems in Test: 15

Date Given: February 10, 1944

Number of Problems Correct	Number of Pupils Receiving Score
15	14
14	5
13	6
12	3
11	0
10	1
9	0
8	2
7	0
6	0
5	0
4	0
3	0
2	1
1	0

CLASS RECORD OF MULTIPLICATION

Test XX - Form A

Number of Problems in Test: 20

Date Given: February 11, 1944

Number of Problems Correct	Number of Pupils Receiving Score
20	4
19	1
18	4
17	9
16	1
15	4
14	3
13	0
12	1
11	0
10	1
9	1
8	0
7	2
6	0
5	0
4	0
3	0
2	1
1	0

CLASS RECORD OF DIVISION

Test XXIX - Form A

Number of Problems in Test: 20

Date Given: February 14, 1944

Number of Problems Correct	Number of Pupils Receiving Score
20	3
19	3
18	2
17	3
16	2
15	6
14	2
13	1
12	1
11	2
10	0
9	0
8	1
7	2
6	1
5	1
4	1
3	0
2	0
1	1

SETTING UP THE DIAGNOSTIC AND REMEDIAL PROGRAM

An analysis of the results of the four survey tests showed that the majority of the class were below par, which in the fundamentals is 100%. This was disappointing and surprising since it was felt that the mechanical skills of this group had been highly developed in previous classes. Apparently the belief that a skill once "learned" can stay indefinitely in the mind, needed to be refashioned into a realization of the need of continuous maintenance program.

The group survey tests discovered those pupils who had difficulties, but these tests did not indicate in which specific skill attainment was lacking. This was to be determined later by using the committee's tests on each specific component skill.

We began by putting the four class record sheets showing the tabulation of the scores on the board. There were no names displayed so any chance of comparison or embarrassment was eliminated. The class was drawn into conversation about the records and the standing of the class. It was evident from the very beginning that the pupils of this class must come to realize that 75 or even 85 per cent average is not satisfactory. This group must be shown the need to aim at one-hundred

per cent mastery of such necessary processes as the four fundamentals. The members of the class were asked to list incidents in their every day activities that necessitated perfection in the use of numbers. The responses came quickly. Some of them were:

1. The buying of War Stamps
2. Purchasing at the store.
3. Recording expenditures and receipts of School programs
4. Managing their own allowances
5. Keeping scores in games
6. Budgeting school time
7. Ordering their weekly milk
8. Scoring arithmetic papers
9. Selling tickets for school entertainments
10. Drawing the school garden to scale

One of the boys told his mother had had parts of an airplane rejected at the plant where she was working, because the parts were one-sixteenth of an inch incorrect. A second boy told of his brother's experience with arithmetic in his navy test, and others made comments showing they were beginning to see the need for perfection.

> "We should do something about this," said one little girl.
>
> "We should add, subtract, multiply and divide for a period every day," was another remark.

The desire to do "something about this" was the source of motivation and interest to be used as the nucleus for the remedial program. The setting up of the program was preceded by a talk to the class in which the learning in arithmetic was compared to a doctor's

diagnosis. This situation was chosen because Edward, a member of the class, had just returned from a week's illness. The boy had been sent home because of a swollen gland. It was thought that he might be coming down with the mumps. The family doctor had not treated the infection until, through a series of tests and treatments, he found the source of the trouble to be a tooth. The necessity for finding causes of trouble was drawn from the class and applied to the arithmetic situation. One of the most pernicious causes of incorrect habits of work in arithmetic is allowing the pupil to exercise on processes which he has not yet learned to do correctly. The class decided that the causes of their errors could be discovered by testing each step in the processes. After putting the cards on the table, so to speak, the members of the class expressed great interest and a desire to use the graded tests to discover which particular skill in a process was causing their deficiency. The pupils were now ready for the diagnostic tests which were to be the basis for remedial teaching.

From the tabulation of the survey tests scores it was discovered that not one pupil in the class was perfect in all four processes. Of the 32 pupils tested, 19 needed to determine by means of specific tests, the causes of their failure in all of the four fundamentals; 5 failed in addition, multiplication and division, 2 in

multiplication and division, 1 in division, 1 in multiplication, 2 in subtraction and division, and 2 in addition and division.

The need for such a large amount of remedial work forced the teacher to realize that the teaching of arithmetic had been a failure. While it is probable that no scheme of teaching will ever entirely eliminate remedial work, it is certainly to be expected that the amount of such treatment should grow notably less. If a school would maintain an adequate program of tests during teaching, difficulties in arithmetic could be checked so promptly that they would be corrected during the teaching period rather than allowed to accumulate to make a problem for remedial procedure. If one can locate the breakdown in a given process as soon as it occurs, the subsequent difficulties due to that breakdown may be avoided entirely. For example, on taking a diagnostic test in subtraction, (Test XIV - Form A) in the eighth grade, one pupil was found to have made errors on thirteen of the fifteen problems. In checking this pupil's paper it was found that eleven of the thirteen errors were due to mistakes in double borrowing. Here was a child who had not learned to borrow when it was being taught, but who was allowed to go on with this serious gap in her arithmetic knowledge until wrong habits were fixed. While remedial work with this child was far better than allowing her to continue in

her difficulties, the most profitable treatment would have been to locate her difficulty while the topic of borrowing was being taught. Much of the energy which is now going into remedial treatment might well be diverted into channels of preventive work. Furthermore, when one considers the difficulties in arithmetic caused by wrong habits of work, which are not easily discovered by any other method than diagnosis, it becomes apparent that in the long run the use of the method of diagnosing, as the teaching in a process moves along, will save the teacher's time.

Frequent unit tests by which the child's difficulties can be discovered promptly is the main aim of the Omaha Public Schools' Testing Program.

In the present situation the tests were to be used to determine the level at which pupil mastery breaks down. However, before starting the detailed diagnosis, a few definite rules as to the manner of proceeding with this work were decided upon. Following are the rules that were used:

1. Determine the level at which mastery breaks down. Each of the fundamentals is divided into a number of component skills which can be measured in isolation.

2. Record results of the diagnosis on pupil's individual record card for further reference in deciding what remedial work is needed.

3. Observe the pupil's habits and methods of work.

4. Use the individual's test results as the basis for remedial work.

5. Practice for control of the skill to be continued until each pupil feels and shows evidence of independence in the process.

6. Evaluate the effectiveness of the remedial work by taking Forms B and C of the tests.

7. Add a new step only after the previous step has been fixed.

8. Use not more than fifteen minutes a day for this remedial program--the regular arithmetic work to continue during the scheduled arithmetic period.

THE DIAGNOSTIC AND REMEDIAL PROGRAM

Selected for special study in the process of addition were the twenty-nine pupils whose scores on Form "A" of Test VIII showed their work to be below the one-hundred per cent standard. To this group was given first, Test I - Primary Addition Facts. After scoring the papers it was found that six pupils did not know the basic facts satisfactorily. On the individual record cards were recorded the facts that each pupil missed. These facts were: 8 plus 9, 6 plus 8, 9 plus 7, 5 plus 8, 9 plus 8, 3 plus 9, 0 plus 7, and 7 plus 6. To this group were given three sets of drill cards covering the basic facts. They were asked to drill themselves or to work in pairs until they felt sure that they had overcome their difficulties. They knew that a test would then be given to check again on this skill.

Twenty-three pupils had a perfect score in the test covering the primary facts. This was recorded on the individual record card as: "Primary Facts--satisfactory" and these pupils were excused from further drill on this skill. To this group of twenty-three was given Test II--Higher Decade Facts, Form B. The scores of this test indicated to nineteen pupils that their disability to add first occurred with these facts. The facts missed were: 7 plus 26, 39 plus 6, 18 plus 3,

8 plus 27, 8 plus 14, 9 plus 17, 39 plus 8, 8 plus 15, 6 plus 28, 5 plus 34, and 25 plus 7. These pupils were shown how necessary these facts are for column addition by analyzing on the board the problem:

```
 9
 5    7 plus 6, a primary fact
 6   13 plus 5, a decade fact
 7   18 plus 9, a decade fact
```

They were shown, also, how the decade facts are related to the familiar primary facts--13 plus 5 is related to the primary fact 3 plus 5, and the decade fact 18 plus 9 is related to the primary fact 8 plus 9. After the pupils were shown the need for learning these facts, one of the group announced that she thought that every one in the group could bring up their work by sufficient drill. Several sets of drill cards covering the decade facts were given to the group with the instructions they might work in small groups or alone, and that when they felt sure of the facts another test would be given to check on their efforts. It was interesting to note this group at work. All, with the exception of three pupils, preferred making their own sets of cards and working by themselves.

Test VI, Form "A" (Column addition with Carrying) was given to the four pupils who had made one-hundred percent on the primary facts and on the test of the higher decades. All four pupils made errors in this

test. One pupil forgot to carry in two problems. The remaining three pupils failed to finish the test in the allotted time. These pupils were taken individually and asked to add out loud. It was discovered they had developed peculiar difficulties. Two of the pupils found first the combinations that they knew best, added these and proceeded to add the other numbers as illustrated by the following:

4	
7	6 and 4 are 10, plus 7 is 17,
6	
32	plus 2 is 19

One pupil had no set rule in adding the carried number. In some of the problems the carried number was added first and in other problems the column was totaled and then the carried number added. To overcome the habit of adding the carried number irregularly and the irregular procedure in column addition much oral work was given. The pupils were asked to add in their heads the combinations as the teacher gave them, writing only when instructed to do so, as:

> 7 plus 5 (pause) plus 9 (pause) plus 6 (pause) plus 4, write the last digit of the sum, add the carried number to 8 (pause) plus 5 (pause) plus 3, write the sum.

There were as many as five groups within the addition group that needed varying types of drill. Each pupil practiced on the skill he needed until he felt certain that he had control of the skill. Form "B", "C"

or "D" was given to evaluate the effectiveness of the drill and a test over a new skill was given only after the previous tested skill was satisfactory. A careful record of the pupil's progress was kept on the individual's record card.

This guided diagnostic remedial program in addition was carried on during a fifteen minute period each day for five weeks. However, it was noticed that the pupils also drilled on the addition skills during their free work periods. The process of subtraction was taken up next in the scheduled fifteen minute period.

Subtraction

Eighteen pupils needed help in the process of subtraction. The same plan as that used in analyzing the skills in addition was carried on during the drill period.

Test IX: Primary Subtraction Facts
Five pupils made errors in this test and were required to drill on these basic facts.

Test X: Higher Decade Subtraction Facts
Six pupils were not sure of this skill and were required to drill on the 175 upper-decade facts.

Test XIII: One Step Adjusting, Occasional Vanishing Lefts and Other Difficulties.
Seven pupils found difficulty with the problems of this test. One pupil became confused. She mixed the "take-away" and "additive" methods. The zero in the minuend was a source of error to two children. The skill involved in "adjusting" was the most common fault of the group.

A careful reteaching of adjusting by the additive method was given to this group, followed by special prepared exercises covering the skill. The first set of exercises contained problems requiring "adjusting" in the units place only, as:

```
 784      6 and what are 14?
-226      3 and what are 8? - adjusting
          2 and what are 7?
```

A second set of exercises required adjusting in the hundred's place only, as:

```
 838      6 and what are 8?
-246      4 and what are 13?
          3 and what are 8? - adjusting
```

Two weeks of specific diagnostic and directed drill was carried on with the process of subtraction. A detailed record was kept on the pupil's record card to aid both in deciding what remedial work was needed and when each fault was eliminated as a result of the practice work that was done.

Multiplication:

Test XV covering the one-hundred basic multiplication facts was the first test given to the twenty-eight pupils who needed help in multiplication. Fourteen pupils made mistakes in this test. The most common errors were found to be those in which 9 was either the multiplier or the multiplicand. Before beginning drill on these basic facts, an effort was made to show the relationship between addition and multiplication and to give the

pupils an understanding of these facts. For example, during a group discussion period the pupils were shown how the multiplication facts could be built up by addition, as:

2 plus 2 plus 2 plus 2 plus 2 plus 2 equals 12

or six twos are 12 2 x 6 equals 12

The 9's presented the largest number of opportunities for generalizing. Pupils discovered that the right hand digit of the products descended in regular order from 9 to 0 and the left hand digit beginning with 1 of 18 ascended to 9 of 90. The pupils were shown the fact that the sum of the digits in each product is 9, as:

$$\begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array} \quad \text{(1 plus 8) equals 9}$$

$$\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array} \quad \text{(5 plus 4) equals 9}$$

These class discussions and activities aimed to eliminate meaningless drill to a study based upon understanding. As a result the group did seem more ready to begin their attack on the one hundred basic facts.

The fourteen pupils who knew the basic multiplication facts were given Test III of the addition process. This test, while it is an addition test, covers the skill of higher decade addition facts needed for carrying in multiplication. Ten pupils made errors in this test, failing in the facts: 48 plus 5, 64 plus 7,

54 plus 8, 48 plus 7, 49 plus 6, 63 plus 5, 72 plus 8, 56 plus 7, and 45 plus 3. The pupils were shown how these higher decade facts were related to the primary addition facts. Drill cards covering these 80 facts were given to the group with the instructions that they would have an opportunity to test their knowledge of these facts when they felt certain of them.

Four pupils discovered their point of weakness to be the zero when given Form "B" of Test XVIII covering the skill, zero in the multiplicand with carrying to the zero. Drill cards covering the 19 zero facts were given to the group for study followed by specially built exercises such as: 3 x 0 plus 4 equals--; 6 x 0 plus 8 equals--; 9 x 0 plus 1 equals--; 3 x 0 plus 4 equals; 6 x 0 plus 8 equals--;

The same method was used in diagnosing the skills in multiplication as in the two previous processes. A period of two weeks was used in the diagnostic remedial program of multiplication.

Division:

As was found in each of the other processes, one of the chief faults in division was the lack of knowledge of the fundamental combinations. When the twenty-nine pupils needing help in division were given Test XXII covering the even and uneven division facts, fourteen pupils made errors. It was discovered that

most of these mistakes were made in the uneven facts, as: $4)\overline{22}$, $7)\overline{17}$, $9)\overline{44}$, $4)\overline{39}$, $8)\overline{75}$. There are 360 uneven facts and 90 even facts. The 450 facts were divided into five sets of 90 facts each. The group drilled themselves on Set I, then Set II, Set III, etc. before proceeding to the next test covering a new skill.

The fifteen pupils who received one-hundred per cent on the basic facts found their weakness in other skills.

Remainder difficulties as tested in Test XXVI, Form "A" were discovered to be the source of errors for eight pupils. A very frequent habit of error grew out of the failure to compare the remainder with the divisor after each subtraction. This failure to compare led to the use of the remainder as a new partial dividend. This is illustrated in an example found on one child's paper:

$$\begin{array}{r} 111 \\ 22\overline{)4688} \\ 22 \\ \hline 24 \\ 22 \\ \hline 28 \\ 22 \\ \hline 6 \end{array}$$

To the group was explained the fact that long division constantly requires the estimation of figures and the exercises of comparing results. The difficulty of this group was connected with the step of finding the tentative quotient figure and correcting it if necessary

after comparing the result. The device of dividing the first digit of the divisor into the first figure of the dividend was shown to this group. They were shown, also, that this first trial is not always correct. Had the divisor been 29, as: 29)$\overline{4688}$ the 2 as the first quotient figure would be wrong. The class was shown that 29 was closer to 30 than 20, so if the second figure of the divisor is 6, 7, 8, or 9 they should use a number one larger than the first figure of the divisor in finding the quotient figure. Exercises were given which contained very simple division problems with the instructions to circle the remainder in the subtraction after comparing it with the divisor each time.

The skill tested in Test XXVII is - the first partial dividend requires one more digit than the divisor contains. Seven pupils made errors in this test. Exercises in finding only the first quotient figures were given to the group. The problems contained two digits in the divisor and required three figures in the dividend.

The diagnostic remedial program of fifteen minutes a day covered a two-week period over the process of division.

By the second week of May the class felt that they were ready to take Form "D" of the tests in which Form "A" had been given in February. What was accomplished

in these three months can perhaps be shown best by the following charts which compare the scores of the two tests.

Chart I

DISTRIBUTION OF SCORES MADE IN ADDITION TEST VIII

Form "A" of this test was given February 9, 1944

Form "D" of this test was given May 9, 1944

Number of Problems Correct	Form "A" Number of Pupils Receiving Score	Form "D" Number of pupils Receiving Score
20	3	11
19	2	6
18	5	3
17	3	6
16	4	3
15	4	2
14	0	1
13	0	0
12	3	0
11	1	0
10	3	0
9	3	0
8	1	0
7	0	0
6	0	0
5	0	0
4	0	0
3	0	0
2	0	0
1	0	0

Chart II

DISTRIBUTION OF SCORES MADE IN SUBTRACTION TEST XIV

Form "A" of this test was given February 10, 1944

Form "D" of this test was given May 10, 1944

Number of Problems Correct	Form "A" Number of Pupils Receiving Score	Form "D" Number of Pupils Receiving Score
15	14	21
14	5	5
13	6	3
12	3	2
11	0	1
10	1	0
9	0	0
8	2	0
7	0	0
6	0	0
5	0	0
4	0	0
3	0	0
2	1	0
1	0	0

Chart III

DISTRIBUTION OF SCORES MADE IN MULTIPLICATION TEST XX

Form "A" of this test was given February 11, 1944

Form "D" of this test was given May 11, 1944

Number of Problems Correct	Form "A" Number of Pupils Receiving Score	Form "D" Number of Pupils Receiving Score
20	4	11
19	1	7
18	4	9
17	9	2
16	1	0
15	4	0
14	3	1
13	0	1
12	1	1
11	0	0
10	1	0
9	1	0
8	0	0
7	2	0
6	0	0
5	0	0
4	0	0
3	0	0
2	1	0
1	0	0

Chart IV

DISTRIBUTION OF SCORES MADE IN DIVISION TEST XXIX

Form "A" of this test was given February 14, 1944

Form "D" of this test was given May 12, 1944

Number of Problems Correct	Form "A" Number of Pupils Receiving Score	Form "D" Number of Pupils Receiving Score
20	3	9
19	3	8
18	2	3
17	3	2
16	2	2
15	6	5
14	2	1
13	1	2
12	1	0
11	2	0
10	0	0
9	0	0
8	1	0
7	2	0
6	1	0
5	1	0
4	1	0
3	0	0
2	0	0
1	1	0

CONCLUSION

After comparing the results of the first tests with the results of comparable second tests, which were given after three months further instruction, the following inferences seem justified:

1. By using the specific component skill tests it was discovered at which level mastery failed in each of the four fundamentals.

2. Increased achievement resulted through this checking of each step in a process and then reteaching of that particular skill which was causing deficiency.

Personal observations derived from the use of the tests:

1. The program was sufficiently challenging to the pupils having high scores in "Form A" of the tests for they maintained their high standard in "Form D".

2. The pupils having the lowest scores in "Form A" made definite improvement. These pupils, of course, had more opportunity to show progress.

3. Long established bad habits cannot be broken by some pupils in a period of three months. The results as indicated by "Form D" show that further instruction and drilling is required by some of the pupils.

4. The concrete evidence of progress contributed outstandingly to the growth in personality of each member of this class. It was a pleasure to watch the pupils develop a sense of security when given a successful method of meeting an arithmetical situation.

5. This manner of testing and drilling brought satisfactory results. Throughout the experiment it was made certain the pupils:

   A. Saw the need and value in a particular type of test followed by drill

   B. Recognized the relationship between skills

   C. Kept individual record cards so that they were aware of their own progress

6. The arithmetic testing material produced by the Testing Committee, which has been scientifically constructed, correctly administered and followed with careful reteaching, represents one of the best helps to learning which the schools afford.

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APPENDIX

THE COMMITTEE'S TEST

ADDITION

Process - Addition
Skill - Primary Addition Facts
Test I
Form A

Raw Score_____

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you know your addition facts. Write the answer as quickly and accurately as you can.

Example A

$\begin{array}{r} 1 \\ 3 \\ \hline 4 \end{array}$ In adding 3 and 1 the answer is 4 and is placed under the problem.

Example B

$\begin{array}{r} 4 \\ 4 \\ \hline \end{array}$ Work this problem before beginning the test.

---

(1) $\begin{array}{r} 2 \\ 8 \\ \hline \end{array}$	(2) $\begin{array}{r} 9 \\ 3 \\ \hline \end{array}$	(3) $\begin{array}{r} 3 \\ 5 \\ \hline \end{array}$	(4) $\begin{array}{r} 4 \\ 0 \\ \hline \end{array}$	(5) $\begin{array}{r} 8 \\ 1 \\ \hline \end{array}$
(6) $\begin{array}{r} 8 \\ 5 \\ \hline \end{array}$	(7) $\begin{array}{r} 2 \\ 3 \\ \hline \end{array}$	(8) $\begin{array}{r} 5 \\ 4 \\ \hline \end{array}$	(9) $\begin{array}{r} 4 \\ 7 \\ \hline \end{array}$	(10) $\begin{array}{r} 7 \\ 3 \\ \hline \end{array}$
(11) $\begin{array}{r} 5 \\ 7 \\ \hline \end{array}$	(12) $\begin{array}{r} 0 \\ 0 \\ \hline \end{array}$	(13) $\begin{array}{r} 2 \\ 4 \\ \hline \end{array}$	(14) $\begin{array}{r} 8 \\ 3 \\ \hline \end{array}$	(15) $\begin{array}{r} 6 \\ 9 \\ \hline \end{array}$
(16) $\begin{array}{r} 9 \\ 7 \\ \hline \end{array}$	(17) $\begin{array}{r} 6 \\ 8 \\ \hline \end{array}$	(18) $\begin{array}{r} 1 \\ 6 \\ \hline \end{array}$	(19) $\begin{array}{r} 0 \\ 2 \\ \hline \end{array}$	(20) $\begin{array}{r} 5 \\ 5 \\ \hline \end{array}$
(21) $\begin{array}{r} 0 \\ 7 \\ \hline \end{array}$	(22) $\begin{array}{r} 8 \\ 9 \\ \hline \end{array}$	(23) $\begin{array}{r} 3 \\ 2 \\ \hline \end{array}$	(24) $\begin{array}{r} 4 \\ 5 \\ \hline \end{array}$	(25) $\begin{array}{r} 6 \\ 2 \\ \hline \end{array}$

Process - Addition
Skill - Primary Addition Facts

Raw Score_____

Test I
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you know your basic addition facts. Write the answers as quickly and accurately as you can.

Example A

$$\begin{array}{r} 2 \\ 4 \\ \hline 6 \end{array}$$

In adding 2 and 4 the answer is 6 and is placed under the problem.

Example B

$$\begin{array}{r} 1 \\ 6 \\ \hline \end{array}$$

Work this problem before beginning the test.

---

(1)	0	(2)	9	(3)	3	(4)	7	(5)	1
	5		2		9		6		3
(6)	9	(7)	6	(8)	9	(9)	5	(10)	4
	5		1		0		6		4
(11)	8	(12)	1	(13)	6	(14)	5	(15)	1
	7		0		7		1		7
(16)	7	(17)	5	(18)	2	(19)	6	(20)	2
	9		3		2		0		5
(21)	2	(22)	6	(23)	7	(24)	9	(25)	0
	7		4		5		9		3

Process - Addition
Skill - Primary Addition Facts

Raw Score_____

Test I
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you know your basic addition facts. Write the answers as quickly and accurately as you can.

Example A

$$\begin{array}{r} 2 \\ 4 \\ \hline 6 \end{array}$$

In adding 2 and 4 the answer is 6 and is placed under the problem.

Example B

$$\begin{array}{r} 1 \\ 6 \\ \hline \end{array}$$

Work this problem before beginning the test.

---

(1)	3	(2)	5	(3)	4	(4)	5	(5)	8
	4		2		9		0		4
(6)	8	(7)	9	(8)	3	(9)	2	(10)	6
	0		8		3		9		5
(11)	8	(12)	1	(13)	0	(14)	1	(15)	7
	8		1		1		4		2
(16)	0	(17)	1	(18)	7	(19)	4	(20)	2
	4		9		1		8		1
(21)	4	(22)	6	(23)	3	(24)	5	(25)	4
	6		3		0		9		2

Process - Addition
Skill - Primary Addition Facts

Raw Score_____

Test I
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you know your basic addition facts. Write the answers as quickly and accurately as you can.

Example A

$$\begin{array}{r} 2 \\ +\ 4 \\ \hline 6 \end{array}$$

In adding 2 and 4 the answer is 6 and is placed under the problem.

Example B

$$\begin{array}{r} 1 \\ +\ 6 \\ \hline \end{array}$$

Work this problem before beginning the test.

---

(1) $\begin{array}{r} 6 \\ +\ 6 \\ \hline \end{array}$	(2) $\begin{array}{r} 5 \\ +\ 8 \\ \hline \end{array}$	(3) $\begin{array}{r} 0 \\ +\ 6 \\ \hline \end{array}$	(4) $\begin{array}{r} 9 \\ +\ 1 \\ \hline \end{array}$	(5) $\begin{array}{r} 3 \\ +\ 8 \\ \hline \end{array}$
(6) $\begin{array}{r} 4 \\ +\ 1 \\ \hline \end{array}$	(7) $\begin{array}{r} 3 \\ +\ 7 \\ \hline \end{array}$	(8) $\begin{array}{r} 1 \\ +\ 8 \\ \hline \end{array}$	(9) $\begin{array}{r} 9 \\ +\ 6 \\ \hline \end{array}$	(10) $\begin{array}{r} 2 \\ +\ 0 \\ \hline \end{array}$
(11) $\begin{array}{r} 3 \\ +\ 1 \\ \hline \end{array}$	(12) $\begin{array}{r} 0 \\ +\ 8 \\ \hline \end{array}$	(13) $\begin{array}{r} 1 \\ +\ 5 \\ \hline \end{array}$	(14) $\begin{array}{r} 8 \\ +\ 6 \\ \hline \end{array}$	(15) $\begin{array}{r} 7 \\ +\ 7 \\ \hline \end{array}$
(16) $\begin{array}{r} 0 \\ +\ 9 \\ \hline \end{array}$	(17) $\begin{array}{r} 2 \\ +\ 6 \\ \hline \end{array}$	(18) $\begin{array}{r} 4 \\ +\ 3 \\ \hline \end{array}$	(19) $\begin{array}{r} 7 \\ +\ 8 \\ \hline \end{array}$	(20) $\begin{array}{r} 9 \\ +\ 4 \\ \hline \end{array}$
(21) $\begin{array}{r} 1 \\ +\ 2 \\ \hline \end{array}$	(22) $\begin{array}{r} 7 \\ +\ 4 \\ \hline \end{array}$	(23) $\begin{array}{r} 3 \\ +\ 6 \\ \hline \end{array}$	(24) $\begin{array}{r} 8 \\ +\ 2 \\ \hline \end{array}$	(25) $\begin{array}{r} 7 \\ +\ 0 \\ \hline \end{array}$

Process - Addition
Skill - Higher Decade Facts
Test II
Form A

Raw Score_____

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you know the higher decade facts in addition. Write the answers as quickly and accurately as you can.

Example A

24
7
31

In adding 7 and 24 the answer is 31 and is placed under the problem.

Example B

35 + 8 = 43

When we add 35 + 8 the answer is 43.

Example C

4 and 28 are_____. Work this problem before beginning the test.

PART I

(1) 23 + 6	(2) 2 + 19	(3) 13 + 2	(4) 0 + 26	(5) 37 + 9	(6) 8 + 31	(7) 32 + 4	(8) 9 + 10
(9) 8 + 29	(10) 12 + 5	(11) 0 + 12	(12) 9 + 35	(13) 14 + 5	(14) 1 + 32	(15) 17 + 8	
(16) 37 + 2	(17) 5 + 26	(18) 4 + 13	(19) 22 + 6	(20) 0 + 15	(21) 34 + 4	(22) 1 + 13	
(23) 7 + 15	(24) 13 + 9	(25) 1 + 24	(26) 0 + 28	(27) 15 + 3	(28) 35 + 8	(29) 16 + 4	
(30) 1 + 27							

PART II

24 + 9 =	16 + 7 =	37 + 3 =
1 + 19 =	0 + 29 =	38 + 6 =
5 + 11 =	4 + 10 =	
36 + 6 =	22 + 8 =	

PART III

12 and 2 are_____	1 and 10 are_____
6 and 29 are_____	34 and 8 are_____
4 and 37 are_____	0 and 27 are_____
23 and 3 are_____	36 and 1 are_____
15 and 5 are_____	3 and 38 are_____

Process - Addition
Skill - Higher Decade Facts
Test II
Form B

Raw Score_____

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you know the higher decade facts in addition. Write the answers as quickly and accurately as you can.

Example A

24
7
31

In adding 7 and 24 the answer is 31 and is placed under the problem.

Example B

35 + 8 = 43 When we add 35 + 8 the answer is 43.

Example C

4 and 28 are____. Work this problem before beginning the test.

PART I

(1)	27 7	(2)	16 0	(3)	9 33	(4)	6 12	(5)	21 8	(6)	37 1	(7)	7 26	(8)	5 22
(9)	8 14	(10)	30 4	(11)	29 2	(12)	15 9	(13)	0 23	(14)	3 17	(15)	1 21		
(16)	6 13	(17)	0 20	(18)	39 1	(19)	2 17	(20)	3 20	(21)	11 5	(22)	30 1		
(23)	28 8	(24)	9 17	(25)	2 33	(26)	8 12	(27)	17 0	(28)	39 6	(29)	4 32		
(30)	16 5														

PART II

25 + 7 =
5 + 34 =
6 + 28 =
1 + 16 =

35 + 0 =
9 + 39 =
12 + 1 =
0 + 18 =

23 + 4 =
39 + 8 =

PART III

4 and 36 are_____
33 and 1 are_____
8 and 15 are_____
9 and 14 are_____
18 and 3 are_____

8 and 27 are_____
14 and 1 are_____
32 and 0 are_____
3 and 25 are_____
17 and 4 are_____

Process - Addition
Skill - Higher Decade Facts
Carrying in Multiplication

Raw Score_____

Test III
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you know the higher decade facts used in carrying in multiplication. Write the answers as quickly and accurately as you can.

Example A
65 + 5 = 70 When we add 65 and 5 the answer is 70 and is placed after the equal sign.

Example B
48 + 6 = Work this problem before beginning the test.

---

(1) 81 + 1 =	(14) 56 + 4 =	(27) 40 + 1 =
(2) 42 + 4 =	(15) 64 + 3 =	(28) 81 + 4 =
(3) 54 + 2 =	(16) 48 + 4 =	(29) 45 + 2 =
(4) 72 + 5 =	(17) 42 + 5 =	(30) 64 + 7 =
(5) 42 + 3 =	(18) 48 + 1 =	(31) 81 + 3 =
(6) 64 + 6 =	(19) 45 + 7 =	(32) 49 + 5 =
(7) 45 + 1 =	(20) 81 + 6 =	(33) 40 + 6 =
(8) 49 + 2 =	(21) 63 + 3 =	(34) 45 + 8 =
(9) 63 + 5 =	(22) 72 + 2 =	(35) 49 + 1 =
(10) 72 + 8 =	(23) 63 + 1 =	(36) 40 + 4 =
(11) 56 + 1 =	(24) 48 + 6 =	(37) 45 + 2 =
(12) 54 + 6 =	(25) 56 + 7 =	(38) 72 + 1 =
(13) 40 + 7 =	(26) 45 + 3 =	(39) 56 + 2 =
		(40) 48 + 5 =

Process - Addition
Skill - Higher Decade Facts
Carrying in Multiplication

Raw Score_____

Test III
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you know the higher decade facts used in carrying in multiplication. Write the answers as quickly and accurately as you can.

Example A
65 + 5 = 70 When we add 65 and 5 the answer is 70 and is placed after the equal sign.

Example B
48 + 6 = Work this Problem before beginning the test.

---

(1) 64 + 1 =	(14) 56 + 6 =	(27) 63 + 6 =
(2) 48 + 2 =	(15) 81 + 2 =	(28) 54 + 3 =
(3) 45 + 6 =	(16) 64 + 5 =	(29) 72 + 7 =
(4) 54 + 5 =	(17) 48 + 7 =	(30) 64 + 4 =
(5) 49 + 3 =	(18) 49 + 4 =	(31) 48 + 3 =
(6) 72 + 4 =	(19) 54 + 7 =	(32) 81 + 7 =
(7) 40 + 3 =	(20) 54 + 1 =	(33) 63 + 8 =
(8) 63 + 4 =	(21) 64 + 2 =	(34) 56 + 5 =
(9) 45 + 5 =	(22) 40 + 2 =	(35) 72 + 3 =
(10) 63 + 7 =	(23) 54 + 8 =	(36) 54 + 4 =
(11) 63 + 2 =	(24) 45 + 4 =	(37) 49 + 6 =
(12) 42 + 1 =	(25) 42 + 6 =	(38) 81 + 5 =
(13) 40 + 5 =	(26) 81 + 8 =	(39) 72 + 6 =
		(40) 56 + 3 =

Process - Addition
Skill - Single Column Addition With and Without Zeros

Raw Score_____

Test IV
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you can add single columns of numbers. Write the answers as quickly and accurately as you can.

Example A

$$\begin{array}{r} 3 \\ 5 \\ 2 \\ \hline 10 \end{array}$$

When we add 2, 5, and 3 the answer is 10.

Example B

4 + 7 + 2 = Work this problem before beginning the test.

---

(1)	2 1 2	(2)	5 2 2	(3)	2 2 6	(4)	7 3 0	(5)	7 6 3
(6)	5 9 3	(7)	0 9 1	(8)	0 2 8	(9)	2 7 7	(10)	7 6 7
(11)	4 2 1	(12)	4 0 9	(13)	5 1 5	(14)	5 0 7	(15)	6 8 1
(16)	3 9 2	(17)	1 5 1	(18)	4 4 0	(19)	3 5 9	(20)	3 8 2

(21) 4 + 3 + 2 = (22) 1 + 1 + 3 = (23) 6 + 7 + 3 =

(24) 1 + 9 + 5 = (25) 6 + 0 + 5 =

Process - Addition
Skill - Single Column Addition With and Without Zeros

Raw Score_____

Test IV
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you can add single columns of numbers. Write the answers as quickly and accurately as you can.

Example A

$$\begin{array}{r} 3 \\ 5 \\ 2 \\ \hline 10 \end{array}$$

When we add 2, 5, and 3 the answer is 10.

Example B

$4 + 7 + 2 =$

Work this problem before beginning the test.

---

(1)	3 1 4	(2)	2 6 8	(3)	0 8 2	(4)	2 9 4	(5)	8 2 0
(6)	7 3 1	(7)	1 7 1	(8)	3 3 1	(9)	5 9 6	(10)	1 1 0
(11)	7 2 4	(12)	4 9 1	(13)	1 8 8	(14)	5 5 9	(15)	0 3 8
(16)	5 0 8	(17)	6 8 6	(18)	9 4 5	(19)	7 2 3	(20)	6 5 4

(21) $8 + 2 + 1 =$ (22) $3 + 7 + 2 =$ (23) $9 + 7 + 3 =$

(24) $7 + 2 + 5 =$ (25) $8 + 1 + 3 =$

Process - Addition
Skill - Single Column Addition With and Without Zeros

Raw Score_____

Test IV
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you can add single columns of numbers. Write the answers as quickly and accurately as you can.

Example A

$$\begin{array}{r} 3 \\ 5 \\ 2 \\ \hline 10 \end{array}$$

When we add 2, 5, and 3 the answer is 10.

Example B

4 + 7 + 2 = Work this problem before beginning the test.

---

(1)	5 0 3	(2)	1 2 5	(3)	3 8 9	(4)	2 4 7	(5)	6 0 6
(6)	7 1 3	(7)	2 6 1	(8)	3 3 3	(9)	7 6 2	(10)	2 5 5
(11)	6 2 2	(12)	2 9 0	(13)	2 4 6	(14)	0 4 2	(15)	6 0 0
(16)	4 3 7	(17)	5 0 1	(18)	5 8 7	(19)	4 4 3	(20)	5 5 1

(21) 5 + 6 + 6 = (22) 7 + 5 + 3 = (23) 9 + 6 + 0 =

(24) 5 + 6 + 3 = (25) 6 + 1 + 5 =

Process - Addition
Skill - Single Column Addition With and Without Zeros

Raw Score_____

Test IV
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you can add single columns of numbers. Write the answers as quickly and accurately as you can.

Example A

3
5
2
10

When we add 2, 5, and 3 the answer is 10.

Example B

4 + 7 + 2 =

Work this problem before beginning the test.

---

(1)	1 8 4	(2)	2 4 8	(3)	3 9 5	(4)	5 7 0	(5)	3 9 8
(6)	8 0 5	(7)	0 5 2	(8)	9 0 4	(9)	9 0 2	(10)	2 9 7
(11)	6 4 1	(12)	4 8 0	(13)	2 2 3	(14)	1 7 2	(15)	3 7 5
(16)	1 3 5	(17)	5 8 3	(18)	5 4 1	(19)	9 5 3	(20)	8 1 7

(21) 6 + 6 + 6 = (22) 4 + 7 + 4 = (23) 6 + 3 + 5 =

(24) 4 + 6 + 0 = (25) 9 + 2 + 1 =

Process - Addition
Skill - Two and Three Place Addends

Raw Score_____

Test V
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you can add problems with two and three place addends. Write the answers as quickly and accurately as you can.

Example A

35
43
78

In adding 35 and 43 the answer is 78 since 5 and 3 are 8 and 4 and 3 are 7.

Example B

372
407

Work this problem before beginning the test.

(1)	70 30 92	(2)	324 953	(3)	453 724 921	(4)	66 21 82
(5)	323 950 223	(6)	73 50	(7)	75 94	(8)	967 231
(9)	732 824 940	(10)	736 452	(11)	973 821	(12)	90 33 72
(13)	50 67 82	(14)	921 722 531	(15)	89 80	(16)	442 851 801
(17)	80 52 51	(18)	624 874	(19)	670 712 413	(20)	324 752

Process - Addition
Skill - Two and Three Place Addends
Test V
Form B

Raw Score_____

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you can add problems with two and three place addends. Write the answers as quickly and accurately as you can.

Example A

35
43
78

In adding 35 and 43 the answer is 78 since 5 and 3 are 8 and 4 and 3 are 7.

Example B

372
407

Work this problem before beginning the test.

---

(1)	67 40	(2)	535 642 421	(3)	903 706	(4)	94 42 82
(5)	201 734 753	(6)	744 834	(7)	554 801 612	(8)	713 725
(9)	43 93 81	(10)	10 94 75	(11)	95 63	(12)	73 73 82
(13)	401 867	(14)	42 92 65	(15)	826 603	(16)	533 952 512
(17)	824 521 634	(18)	95 84	(19)	602 204 903	(20)	452 820 917

Process - Addition
Skill - Two and Three Place Addends

Raw Score_____

Test V
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you can add problems with two and three place addends. Write the answers as quickly and accurately as you can.

Example A

35
43
78

In adding 35 and 43 the answer is 78 since 5 and 3 are 8 and 4 and 3 are 7.

Example B

372
407

Work this problem before beginning the test.

---

(1)	540 923 434	(2)	50 89	(3)	643 753	(4)	62 53 80
(5)	811 602 705	(6)	862 724	(7)	903 975	(8)	40 84 75
(9)	621 978	(10)	22 93 83	(11)	51 75	(12)	30 54 70
(13)	802 437	(14)	612 125 962	(15)	40 63 95	(16)	923 841 334
(17)	41 63	(18)	322 624 523	(19)	82 97	(20)	71 42 66

Process - Addition
Skill - Two and Three Place Addends

Raw Score_____

Test V
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you can add problems with two and three place addends. Write the answers as quickly and accurately as you can.

Example A

35
43
78

In adding 35 and 43 the answer is 78 since 5 and 3 are 8 and 4 and 3 are 7.

Example B

372
407

Work this problem before beginning the test.

---

(1)	903 833 541	(2)	61 82 92	(3)	453 936	(4)	85 54
(5)	301 984 100	(6)	731 621	(7)	420 313 852	(8)	60 71 30
(9)	911 813 212	(10)	548 921	(11)	72 53 93	(12)	702 346
(13)	351 826	(14)	95 80	(15)	551 723 625	(16)	41 95 81
(17)	803 414	(18)	430 416 952	(19)	48 70	(20)	73 82 43

Process - Addition
Skill - Multiple Place Addends With Gaps and Zeros--No Carrying

Raw Score_____

Test VI
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can add in columns. In adding you do not need to carry in this test.

Example A

24
31
2
57

In this problem we add 2 and 1 and 4 and place the answer 7 under the right hand column. Then we add 3 and 2 and the answer 5 is placed under the second column.

Example B

312
40
4

Work this problem before beginning the test.

---

(1)	310 31 828 320	(2)	42 150 801 805	(3)	32 71 93 1	(4)	1 30 744 424	(5)	5126 7003 3140
(6)	21 203 612 963	(7)	80 610 607 502	(8)	405 261 923 10	(9)	33 2 531 520	(10)	323 50 625 401
(11)	1 427 301 40 10	(12)	100 203 690 702	(13)	801 13 762 511	(14)	11 302 656 830	(15)	422 710 7 40
(16)	3 60 911 915	(17)	10 902 930 214	(18)	140 305 21 901	(19)	10 940 721 27	(20)	301 735 340 413

Process - Addition
Skill - Multiple Place Addends With Gaps and Zeros--No Carrying

Raw Score_____

Test VI
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____ Grade_____ Date_____

Directions to Pupils: This test is to find out how well you can add in columns. In adding you do not need to carry in this test.

Example A

```
 24
 31
  2
 57
```

In this problem we add 2 and 1 and 4 and place the answer 7 under the right hand columns. Then we add 3 and 2 and the answer 5 is placed under the second column.

Example B

```
312
 40
  4
```

Work this problem before beginning the test.

(1)	401	(2)	440	(3)	12	(4)	31	(5)	14
	180		2		405		22		303
	901		913		610		903		901
	5		334		70		343		871
(6)	710	(7)	302	(8)	401	(9)	100	(10)	7
	823		64		501		905		22
	52		902		52		693		840
	13		431		642		600		220
(11)	701	(12)	310	(13)	1040	(14)	401	(15)	1
	711		8		9143		47		310
	606		851		6601		500		864
	20		420				751		821
(16)	130	(17)	21	(18)	3	(19)	10	(20)	401
	208		713		11		515		907
	801		2		882		963		60
	760		710		901		1		10

Process - Addition
Skill - Multiple Place Addends With Gaps and Zeros--No Carrying

Raw Score_____

Test VI
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____ Grade_____ Date_____

Directions to Pupils: This test is to find out how well you can add in columns. In adding you do not need to carry in this test.

Example A

```
 24
 31
  2
 57
```

In this problem we add 2 and 1 and 4 and place the answer 7 under the right hand column. Then we add 3 and 2 and the answer 5 is placed under the second column.

Example B

```
312
 40
  4
```

Work this problem before beginning the test.

---

(1)	10	(2)	310	(3)	100	(4)	102	(5)	6010
	403		701		900		20		4483
	320		682		40		813		8405
	856		2		50		563		
(6)	52	(7)	12	(8)	1710	(9)	4	(10)	530
	204		311		9137		700		606
	513		53		9042		262		21
	830		702				833		941
(11)	21	(12)	200	(13)	453	(14)	622	(15)	211
	25		401		704		1		10
	633		782		30		845		675
	410		10		911		301		602
(16)	13	(17)	201	(18)	5	(19)	512	(20)	20
	810		24		34		2		532
	846		460		920		714		705
	20		912		830		710		30

Process - Addition
Skill - Multiple Place Addends With Gaps and Zeros--No Carrying

Raw Score_____

Test VI
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can add in columns. In adding you do not need to carry in this test.

Example A

24
31
2
57

In this problem we add 2 and 1 and 4 and place the answer 7 under the right hand column. Then we add 3 and 2 and the answer 5 is placed under the second column.

Example B

312
40
4

Work this problem before beginning the test.

---

(1)	301 741 451 3	(2)	52 11 302 914	(3)	2104 8344 6130	(4)	603 680 15 501	(5)	10 702 843 23
(6)	613 11 703 770	(7)	2 300 296 801	(8)	230 605 722 32	(9)	2002 9614 5221	(10)	10 751 528 10
(11)	812 2 20 954	(12)	36 33 300 820	(13)	802 801 76 20	(14)	20 500 675 904	(15)	601 20 612 443
(16)	904 10 472 12	(17)	61 103 820 515	(18)	3 620 713 43	(19)	300 52 906 941	(20)	3101 6802 6093

Process - Addition Raw Score_____
Skill - One, two and three place addends with carrying. Sum of left-hand column less than 10.
Test VII
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can add one, two and three place addends when carrying is necessary. Write the answers as quickly and accurately as you can.

Example A

24
16
15
55

When we add 5, 6, and 4 the answer is 15. 5 is written down under the right hand column and 1 must be carried to the second column. Adding the second column, then, the answer is 5 and the answer becomes 55.

Example B

318
143
101

Work this problem before beginning the test.

---

(1)	348 133 191	(2)	484 213 337	(3)	322 39 443 58	(4)	526 254 133 35 32	(5)	28 12
(6)	3 6 2 3 9	(7)	253 123 232 53	(8)	50 277 64 11	(9)	282 324 156	(10)	138 47 10
(11)	133 392 256	(12)	223 234 343	(13)	350 346 333 29	(14)	215 432 169	(15)	365 264 21 83
(16)	246 298 230 22	(17)	369 333 236 53	(18)	13 206 144 20	(19)	349 133 40 38 4	(20)	253 406 60 4

Process - Addition Raw Score_____
Skill - One, two and three place addends with carrying. Sum of left-hand column less than 10.
Test VII
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can add one, two and three place addends when carrying is necessary. Write the answers as quickly and accurately as you can.

Example A

24
16
15
55

When we add 5, 6, 4, the answer is 15. 5 is written down under the right hand column and 1 must be carried to the second column. Adding the second column then, the answer is 5 and the answer becomes 55.

Example B

318
143
101

Work this problem before beginning the test.

---

(1)	362 433 28	(2)	493 32 249	(3)	638 49 168	(4)	3 6 14	(5)	256 133 349
(6)	76 3 14	(7)	14 18 20	(8)	60 349 11	(9)	13 29 24	(10)	32 69 33
(11)	96 83 60 2	(12)	69 46 3 11	(13)	540 142 93 42	(14)	9 23 27 29	(15)	28 53 6 22
(16)	42 28 68	(17)	542 184 148	(18)	693 285 36	(19)	498 116 249	(20)	353 457 168

Process - Addition Raw Score_____
Skill - One, two, and three place addends with carrying. Sum of the left hand column less than 10.
Test VII
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can add one, two , and three place addends when carrying is necessary. Write the answers as quickly and accurately as you can.

Example A

24
16
15
55

When we add 5, 6, 4, the answer is 15. 5 is written down under the right hand column and 1 must be carried to the second column. Adding the second column then the answer is 5 and the answer becomes 55.

Example B

318
143
101

Work this problem before beginning the test.

---

(1)	38 44 12	(2)	33 28 15	(3)	584 116	(4)	285 467 115	(5)	256 235 322
(6)	68 17	(7)	449 236 148	(8)	27 34 12	(9)	284 277 276	(10)	24 47 14
(11)	699 22 67	(12)	86 77 679	(13)	24 68	(14)	9 69	(15)	4 79 9
(16)	202 41 686	(17)	27 68 4	(18)	9 22 67	(19)	293 450 208	(20)	34 56

Process - Addition Raw Score_____
Skill - One, two, and three place addends with carrying. Sum of the left-hand column less than 10.
Test VII
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can add one, two and three place addends when carrying is necessary. Write the answers as quickly and accurately as you can.

Example A

24
16
15
55

When we add 5, 6, 4, the answer is 15. 5 is written down under the right hand column and 1 must be carried to the second column. Adding the second column then, the answer is 5 and the answer becomes 55.

Example B

318
143
101

Work this problem before beginning the test.

---

(1)	7 1 62	(2)	8 7 34	(3)	156 134 481 112	(4)	7 5 1 18	(5)	8 5 39
(6)	4 231 196	(7)	2 7 5 31 18	(8)	18 44 27	(9)	4697 879 786 921 2288	(10)	201 298 266 225
(11)	5 8 58 402 11	(12)	195 739	(13)	23 34 23	(14)	99 21 127 388 287	(15)	29 3 45 8
(16)	8 775 85	(17)	8 4 1 68	(18)	5682 358 36 743 1306	(19)	3 1 32 408	(20)	93 69 289 324

Process - Addition
Skill - Column Addition With Carrying, Gaps, and Zeros
Test VIII
Form A

Raw Score_____

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can add in columns. Watch for gaps and zeros and be careful that carrying is done correctly. Write the answers as quickly and accurately as you can.

Example A

312
141
80
16
549

When we add 6, 0, 1, and 2 the answer is 9 and is placed under the right hand column. When we add 1, 8, 4, and 1 the answer is 14. 4 is placed under the second column and 1 is carried. When we add this 1 which is carried to 1 and 3 the answer is 5 and the answer to the problem is 549.

Example B

244
37
25
6

Work this problem before beginning the test.

---

(1)	98	(2)	94	(3)	84	(4)	84	(5)	79
	84		9		67		73		85
	77		86		24		5		8
	56		74		75		3		64
	64		42		33		50		68
	45		70		89		28		76
(6)	874	(7)	89	(8)	688	(9)	99	(10)	565
	670		677		469		288		77
	96		68		94		62		876
	585		755		876		757		789
	642		583		458		147		468
	67		360		934		93		121
(11)	596	(12)	779	(13)	66	(14)	5998	(15)	362
	7784		28		391		759		854
	897		995		34		1345		32
	5675		636		912		194		523
	8529		998		190		3229		264
	7016		805		609		1787		386
(16)	339	(17)	922	(18)	68	(19)	48	(20)	52
	118		93		9		27		13
	4		601		43		83		47
	259		110		69		19		60
	749		959		82		91		97
	568		135		98		38		81
					47		29		98

Process - Addition Raw Score_____
Skill - Column addition With Carrying, Gaps, and Zeros
Test VIII
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can add in columns. Watch for gaps and zeros and be careful that carrying is done correctly. Write the answers as quickly and accurately as you can.

Example A

312
141
80
16
549

When we add 6, 0, and 1 and 2 the answer is 9 and is placed under the right hand column. When we add 1,8,4, and 1 the answer is 14. 4 is placed under the second column and 1 is carried. When we add this 1 which is carried to 1 and 3 the answer is 5 and the answer to the problem is 549.

Example B

244
37
25
6

Work this problem before beginning the test.

(1)	90	(2)	48	(3)	107	(4)	89	(5)	1087
	39		49		48		25		495
	46		88		72		48		64
	78		56		96		57		520
	55		38		347		66		73
	98		96		89		39		147
	79				57				
(6)	92	(7)	1220	(8)	721	(9)	1608	(10)	3420
	1004		96		4682		923		9057
	167		157		859		7002		762
	3096		92		1907		844		426
	481		848		952		1693		790
	1740		67		304		765		
(11)	429	(12)	1024	(13)	72	(14)	425	(15)	1372
	4848		983		123		87		1504
	797		49		7047		694		625
	9879		137		696		49		88
	438		840		656		1020		4284
	965								
(16)	72	(17)	5427	(18)	851	(19)	78	(20)	6749
	451		341		68		5009		954
	7480		6074		140		488		7596
	195		138		73		345		775
	5459		6002		165		172		6147
	733		170		97		1657		1934

Process - Addition Raw Score_____
Skill - Column Addition With Carrying, Gaps, and Zeros
Test VIII
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can add in columns. Watch for gaps and zeros and be careful that carrying is done correctly. Write the answers as quickly and accurately as you can.

Example A

312
131
90
16
549

When we add 6, 0, 1, and 2 the answer is 9 and is placed under the right hand column. When we add 1, 9, 3, and 1 the answer is 14. 4 is placed under the second column and 1 is carried. When we add this 1 which is carried to land 3 the answer is 5 and the answer to the problem is 549.

Example B

244
37
25
6

Work this problem before beginning the test.

(1)	27	(2)	34	(3)	87	(4)	16	(5)	18
	45		23		5		3		5
	93		8		90		87		85
	6		82		72		66		57
	60		75		69		60		40
	98		3		4		29		13
(6)	784	(7)	926	(8)	467	(9)	506	(10)	846
	456		79		35		657		702
	42		663		468		984		615
	198		727		201		9		77
	600		504		20		38		64
	5		9		132		518		590
(11)	320	(12)	532	(13)	698	(14)	789	(15)	876
	8		678		403		90		43
	49		40		84		456		942
	204		632		258		864		30
	123		9		30		32		789
	562		243		446		723		361
(16)	6901	(17)	3695	(18)	37	(19)	49	(20)	50
	7525		4987		6		8		9
	874		506		64		63		41
	83		48		89		40		35
	8499		2134		43		30		23
	3770		657		76		21		7
					62		2		41

Process - Addition Raw Score_____
Skill - Column Addition With Carrying, Gaps, and Zeros
Test VIII
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can add in columns. Watch for gaps and zeros and be careful that carrying is done correctly. Write the answers as quickly and accurately as you can.

Example A

312
141
80
16
549

When we add 6, 0, 1, and 2 the answer is 9 and is placed under the right hand column. When we add 1, 8, 4, and 1 the answer is 14. 4 is placed under the second column and 1 is carried. When we add this 1 which is carried to 1 and 3 the answer is 5 and the answer to the problem is 549.

Example B

244
37
25
6

Work this problem before beginning the test

(1)	34	(2)	60	(3)	96	(4)	61	(5)	96
	4		50		63		81		68
	27		9		4		70		7
	68		98		80		8		89
	18		87		69		55		70
	97		46		76		37		35
(6)	70	(7)	420	(8)	805	(9)	378	(10)	587
	531		508		16		505		29
	79		87		184		48		470
	406		765		700		347		6
	843		9		558		355		982
	365		624		27		4		649
(11)	767	(12)	65	(13)	847	(14)	615	(15)	784
	607		909		608		732		69
	810		496		39		401		2
	43		535		280		549		987
	954		345		4		70		390
	5		79		999		3		132
(16)	4689	(17)	7451	(18)	75	(19)	59	(20)	89
	5062		490		83		30		59
	8364		6321		42		2		7
	46		4560		9		3		43
	6000		47		78		95		66
	5		1532		55		76		50
					64		68		34

THE COMMITTEE'S TEST

SUBTRACTION

Process - Subtraction
Skill - Primary Subtraction Facts

Raw Score_____

Test IX
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you know the primary subtraction facts.

Example A

$$\begin{array}{r} 5 \\ -\ 1 \\ \hline 4 \end{array}$$

When we subtract 1 from 5 the answer is 4 as shown in the example.

Example B

$$\begin{array}{r} 8 \\ -\ 3 \\ \hline \end{array}$$

Work this problem before beginning the test.

---

(1) $\begin{array}{r} 7 \\ -\ 4 \\ \hline \end{array}$	(2) $\begin{array}{r} 5 \\ -\ 5 \\ \hline \end{array}$	(3) $\begin{array}{r} 9 \\ -\ 4 \\ \hline \end{array}$	(4) $\begin{array}{r} 13 \\ -\ 8 \\ \hline \end{array}$	(5) $\begin{array}{r} 2 \\ -\ 0 \\ \hline \end{array}$
(6) $\begin{array}{r} 8 \\ -\ 5 \\ \hline \end{array}$	(7) $\begin{array}{r} 14 \\ -\ 9 \\ \hline \end{array}$	(8) $\begin{array}{r} 4 \\ -\ 4 \\ \hline \end{array}$	(9) $\begin{array}{r} 11 \\ -\ 7 \\ \hline \end{array}$	(10) $\begin{array}{r} 15 \\ -\ 8 \\ \hline \end{array}$
(11) $\begin{array}{r} 5 \\ -\ 4 \\ \hline \end{array}$	(12) $\begin{array}{r} 18 \\ -\ 9 \\ \hline \end{array}$	(13) $\begin{array}{r} 4 \\ -\ 1 \\ \hline \end{array}$	(14) $\begin{array}{r} 16 \\ -\ 9 \\ \hline \end{array}$	(15) $\begin{array}{r} 9 \\ -\ 7 \\ \hline \end{array}$
(16) $\begin{array}{r} 14 \\ -\ 5 \\ \hline \end{array}$	(17) $\begin{array}{r} 17 \\ -\ 8 \\ \hline \end{array}$	(18) $\begin{array}{r} 8 \\ -\ 0 \\ \hline \end{array}$	(19) $\begin{array}{r} 4 \\ -\ 2 \\ \hline \end{array}$	(20) $\begin{array}{r} 10 \\ -\ 9 \\ \hline \end{array}$
(21) $\begin{array}{r} 8 \\ -\ 4 \\ \hline \end{array}$	(22) $\begin{array}{r} 7 \\ -\ 0 \\ \hline \end{array}$	(23) $\begin{array}{r} 9 \\ -\ 4 \\ \hline \end{array}$	(24) $\begin{array}{r} 11 \\ -\ 6 \\ \hline \end{array}$	(25) $\begin{array}{r} 3 \\ -\ 0 \\ \hline \end{array}$

Process - Subtraction
Skill - Primary Subtraction Facts

Raw Score_____

Test IX
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you know the primary subtraction facts.

Example A

$\begin{array}{r} 7 \\ 4 \\ \hline 3 \end{array}$ When we subtract 4 from 7 the answer is 3 as shown in the example.

Example B

$\begin{array}{r} 2 \\ 0 \\ \hline \end{array}$ Work this problem before beginning the test.

---

(1) $\begin{array}{r} 14 \\ 6 \\ \hline \end{array}$	(2) $\begin{array}{r} 15 \\ 9 \\ \hline \end{array}$	(3) $\begin{array}{r} 5 \\ 1 \\ \hline \end{array}$	(4) $\begin{array}{r} 10 \\ 6 \\ \hline \end{array}$	(5) $\begin{array}{r} 7 \\ 7 \\ \hline \end{array}$
(6) $\begin{array}{r} 13 \\ 9 \\ \hline \end{array}$	(7) $\begin{array}{r} 10 \\ 4 \\ \hline \end{array}$	(8) $\begin{array}{r} 2 \\ 1 \\ \hline \end{array}$	(9) $\begin{array}{r} 5 \\ 0 \\ \hline \end{array}$	(10) $\begin{array}{r} 11 \\ 3 \\ \hline \end{array}$
(11) $\begin{array}{r} 9 \\ 2 \\ \hline \end{array}$	(12) $\begin{array}{r} 12 \\ 5 \\ \hline \end{array}$	(13) $\begin{array}{r} 8 \\ 3 \\ \hline \end{array}$	(14) $\begin{array}{r} 6 \\ 3 \\ \hline \end{array}$	(15) $\begin{array}{r} 9 \\ 8 \\ \hline \end{array}$
(16) $\begin{array}{r} 12 \\ 3 \\ \hline \end{array}$	(17) $\begin{array}{r} 8 \\ 6 \\ \hline \end{array}$	(18) $\begin{array}{r} 15 \\ 6 \\ \hline \end{array}$	(19) $\begin{array}{r} 0 \\ 0 \\ \hline \end{array}$	(20) $\begin{array}{r} 13 \\ 4 \\ \hline \end{array}$
(21) $\begin{array}{r} 13 \\ 5 \\ \hline \end{array}$	(22) $\begin{array}{r} 8 \\ 1 \\ \hline \end{array}$	(23) $\begin{array}{r} 12 \\ 4 \\ \hline \end{array}$	(24) $\begin{array}{r} 10 \\ 3 \\ \hline \end{array}$	(25) $\begin{array}{r} 9 \\ 6 \\ \hline \end{array}$

Process - Subtraction
Skill - Primary Subtraction Facts

Raw Score_____

Test IX
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you know the primary subtraction facts.

Example A

$\begin{array}{r} 9 \\ -\ 1 \\ \hline 8 \end{array}$ When we subtract 1 from 9 the answer is 8 as shown in the example.

Example B

$\begin{array}{r} 6 \\ -\ 4 \\ \hline \end{array}$ Work this problem before beginning the test.

---

(1) $\begin{array}{r} 11 \\ -\ 9 \\ \hline \end{array}$	(2) $\begin{array}{r} 4 \\ -\ 0 \\ \hline \end{array}$	(3) $\begin{array}{r} 7 \\ -\ 6 \\ \hline \end{array}$	(4) $\begin{array}{r} 10 \\ -\ 8 \\ \hline \end{array}$	(5) $\begin{array}{r} 11 \\ -\ 4 \\ \hline \end{array}$
(6) $\begin{array}{r} 9 \\ -\ 3 \\ \hline \end{array}$	(7) $\begin{array}{r} 13 \\ -\ 7 \\ \hline \end{array}$	(8) $\begin{array}{r} 10 \\ -\ 2 \\ \hline \end{array}$	(9) $\begin{array}{r} 17 \\ -\ 9 \\ \hline \end{array}$	(10) $\begin{array}{r} 6 \\ -\ 6 \\ \hline \end{array}$
(11) $\begin{array}{r} 3 \\ -\ 1 \\ \hline \end{array}$	(12) $\begin{array}{r} 11 \\ -\ 8 \\ \hline \end{array}$	(13) $\begin{array}{r} 1 \\ -\ 0 \\ \hline \end{array}$	(14) $\begin{array}{r} 7 \\ -\ 2 \\ \hline \end{array}$	(15) $\begin{array}{r} 12 \\ -\ 8 \\ \hline \end{array}$
(16) $\begin{array}{r} 5 \\ -\ 3 \\ \hline \end{array}$	(17) $\begin{array}{r} 12 \\ -\ 9 \\ \hline \end{array}$	(18) $\begin{array}{r} 7 \\ -\ 3 \\ \hline \end{array}$	(19) $\begin{array}{r} 8 \\ -\ 7 \\ \hline \end{array}$	(20) $\begin{array}{r} 10 \\ -\ 5 \\ \hline \end{array}$
(21) $\begin{array}{r} 9 \\ -\ 0 \\ \hline \end{array}$	(22) $\begin{array}{r} 11 \\ -\ 5 \\ \hline \end{array}$	(23) $\begin{array}{r} 13 \\ -\ 6 \\ \hline \end{array}$	(24) $\begin{array}{r} 2 \\ -\ 2 \\ \hline \end{array}$	(25) $\begin{array}{r} 7 \\ -\ 5 \\ \hline \end{array}$

Process - Subtraction
Skill - Primary Subtraction Facts

Raw Score_____

Test IX
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you know the primary subtraction facts.

Example A

7
6
1

When we subtract 6 from 7 the answer is 1 as shown in the example.

Example B

11
8

Work this problem before beginning the test.

---

(1) 15 − 7	(2) 9 − 1	(3) 11 − 2	(4) 7 − 1	(5) 14 − 8
(6) 12 − 7	(7) 6 − 0	(8) 10 − 1	(9) 6 − 4	(10) 3 − 3
(11) 8 − 2	(12) 12 − 6	(13) 1 − 1	(14) 5 − 2	(15) 9 − 9
(16) 6 − 5	(17) 8 − 8	(18) 14 − 7	(19) 3 − 2	(20) 16 − 7
(21) 4 − 3	(22) 6 − 2	(23) 10 − 7	(24) 16 − 8	(25) 6 − 1

Process - Subtraction
Skill - Higher Decade Facts

Raw Score_____

Test X
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This testis to find out how well you know your higher decade subtraction facts.

Example A

12
10
2

When we subtract 10 from 12 the answer is 2 as shown in the example.

Example B

71
63

Work this problem before beginning the test.

PART I

(1) 22 16	(2) 13 12	(3) 43 42	(4) 66 63	(5) 30 28	(6) 56 54
(7) 71 64	(8) 29 27	(9) 80 72	(10) 18 14	(11) 34 30	(12) 62 56
(13) 45 40	(14) 52 45	(15) 85 81	(16) 11 10	(17) 34 28	(18) 60 54
(19) 47 42	(20) 29 24	(21) 70 63	(22) 17 15	(23) 53 49	(24) 42 40
(25) 89 81	(26) 51 48	(27) 48 45	(28) 25 24	(29) 25 18	(30) 38 36
(31) 58 56	(32) 18 16	(33) 21 18	(34) 67 64	(35) 33 27	

PART II

(1) 17 - 12	(5) 35 - 32	(9) 39 - 32
(2) 23 - 20	(6) 27 - 25	(10) 55 - 48
(3) 42 - 36	(7) 39 - 35	
(4) 76 - 72	(8) 24 - 21	

Process - Subtraction
Skill - Higher Decade Facts

Raw Score_____

Test X
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you know your higher decade subtraction facts.

Example A

17
15
2

When we subtract 15 from 17 the answer is 2 as shown in the example.

Example B

34
28

Work this problem before beginning the test.

PART I

(1) 31 28	(2) 19 14	(3) 40 35	(4) 24 20	(5) 71 63	(6) 50 49
(7) 82 81	(8) 12 10	(9) 61 54	(10) 31 30	(11) 57 54	(12) 77 72
(13) 52 48	(14) 48 42	(15) 54 49	(16) 63 56	(17) 19 16	(18) 25 21
(19) 30 24	(20) 44 42	(21) 59 56	(22) 30 27	(23) 43 40	(24) 68 64
(25) 36 35	(26)23 16	(27) 73 72	(28) 36 32	(29) 49 45	(30) 26 18
(31) 86 81	(32) 14 12	(33) 43 36	(34) 35 30	(35) 59 56	

PART II

(1) 22 - 18	(4) 67 - 63	(7) 46 - 40
(2) 26 - 24	(5) 34 - 27	(8) 39 - 36
(3)18 - 15	(6) 28 - 25	(9) 61 - 54

Process - Subtraction
Skill - Higher Decade Facts

Raw Score_____

Test X
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you know your higher decade subtraction facts.

Example A

20
18
2

When we subtract 18 from 20 the answer is 2 as shown in the example.

Example B

33
28

Work this problem before beginning the test.

PART I

(1) 47 40	(2) 20 16	(3) 51 49	(4) 37 32	(5) 44 40	(6) 27 24
(7) 69 64	(8) 29 25	(9) 15 12	(10) 60 56	(11) 58 54	(12) 83 81
(13) 26 21	(14) 40 36	(15) 32 30	(16) 55 49	(17) 13 10	(18) 74 72
(19) 46 45	(20) 64 63	(21) 35 27	(22) 50 45	(23) 19 15	(24) 37 35
(25) 23 18	(26) 49 48	(27) 87 81	(28) 41 35	(29) 22 21	(30) 53 48
(31) 65 64	(32) 44 36	(33) 19 18	(34) 33 32	(35) 45 42	

PART II

(1) 32 - 28	(4) 20 - 14	(7) 68 - 63
(2) 21 - 20	(5) 31 - 27	(8) 16 - 14
(3) 78 - 72	(6) 62 - 54	(9) 31 - 24

Process - Subtraction
Skill - Higher Decade Facts

Raw Score_____

Test X
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you know your higher decade subtraction facts.

Example A

13 When we subtract 10 from 13
10 the answer is 3 as shown
3 in the example.

Example B

41
35

Work this problem before beginning the test.

PART I

(1) 46 42	(2) 32 27	(3) 84 81	(4) 17 14	(5) 28 24	(6) 70 64
(7) 55 54	(8) 27 21	(9) 54 48	(10) 14 10	(11) 61 56	(12) 33 30
(13) 23 21	(14) 65 63	(15) 88 81	(16) 26 25	(17) 20 18	(18) 79 72
(19) 38 35	(20) 50 48	(21) 41 40	(22) 41 36	(23) 75 72	(24) 17 16
(25) 59 54	(26) 33 28	(27) 29 28	(28) 16 12	(29) 57 56	(30) 37 36
(31) 52 49	(32) 43 42	(33) 38 32	(34) 69 63	(35) 21 16	

PART II

(1) 24 - 18	(4) 47 - 45	(7) 22 - 20
(2) 34 - 32	(5) 16 - 15	(8) 51 - 45
(3) 66 - 64	(6) 51 - 45	(9) 28 - 27

Process - Subtraction Raw Score_____
Skill - Simple subtraction, no borrowing (adjusting), last subtraction a zero not brought down.

Test XI
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can subtract. There is no need to borrow in these problems but you may find that the left hand number is a zero which is not brought down.

Example A
473
231
242
When we subtract 231 from 473 the answer is 242 in this example.

Example B
264
240
Work this problem before beginning the test.

(1)	928 102	(2)	8137 5024	(3)	756 302	(4)	6857 6431
(5)	6597 2073	(6)	946 525	(7)	957 925	(8)	578 405
(9)	486 471	(10)	9381 2230	(11)	798 640	(12)	172 140
(13)	347 312	(14)	8036 8010	(15)	7948 7314	(16)	864 630
(17)	593 570	(18)	856 114	(19)	4968 2036	(20)	294 281

Process - Subtraction Raw Score_____
Skill - Simple subtraction, no borrowing (adjusting), last subtraction a zero not brought down.

Test XI
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can subtract. There is no need to borrow in these problems but you may find that the left hand number is a zero which is not brought down.

Example A

473
231
242

When we subtract 231 from 473 the answer is 242 in this example.

Example B

264
240

Work this problem before beginning the test.

(1)	182 141	(2)	345 214	(3)	5877 5764	(4)	746 504
(5)	986 410	(6)	5997 1122	(7)	997 963	(8)	955 530
(9)	653 620	(10)	9951 3020	(11)	894 874	(12)	8642 6402
(13)	878 502	(14)	397 381	(15)	206 203	(16)	8377 2135
(17)	468 423	(18)	345 214	(19)	7842 7621	(20)	668 510

Process - Subtraction Raw Score_____
Skill - Simple subtraction, no borrowing (adjusting), last subtraction a zero not brought down.

Test XI
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can subtract. There is no need to borrow in these problems but you may find that the left hand number is a zero which is not brought down.

Example A

473
231
242

When we subtract 231 from 473 the answer is 242 in this example.

Example B

264
240

Work this problem before beginning the test.

(1)	596 352	(2)	674 623	(3)	8497 1273	(4)	236 214
(5)	9847 3515	(6)	238 106	(7)	352 340	(8)	967 821
(9)	8769 8406	(10)	637 526	(11)	7583 7142	(12)	864 510
(13)	5816 1004	(14)	174 152	(15)	586 233	(16)	5089 5024
(17)	7961 3150	(18)	474 102	(19)	485 410	(20)	998 927

Process - Subtraction Raw Score_____
Skill - Simple subtraction, no borrowing (adjusting), last subtraction a zero not brought down.

Test XI
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can subtract. There is no need to borrow in these problems but you may find that the left hand number is a zero which is not brought down.

Example A
473
231
242
When we subtract 231 from 473 the answer is 242 in this example.

Example B
264
240
Work this problem before beginning the test.

(1)	172 151	(2)	645 213	(3)	7949 5108	(4)	398 327
(5)	752 440	(6)	983 342	(7)	8576 8404	(8)	857 524
(9)	639 315	(10)	467 453	(11)	6458 6202	(12)	286 131
(13)	976 920	(14)	934 403	(15)	597 561	(16)	817 606
(17)	269 250	(18)	8745 2421	(19)	6385 4201	(20)	7958 7731

Process - Subtraction Raw Score_____
Skill - Subtraction with gaps - no borrowing

Test XII
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can subtract using two, three, and four place numbers. No borrowing is necessary.

Example A

39
4
35

When we subtract 4 from 39 the answer is 35 as shown.

Example B

493
61

Work this problem before beginning the test.

---

(1) 97 − 1	(2) 179 − 36	(3) 5323 − 102	(4) 986 − 40	(5) 475 − 74
(6) 6238 − 203	(7) 8974 − 700	(8) 58 − 5	(9) 369 − 19	(10) 2754 − 614
(11) 297 − 82	(12) 921 − 10	(13) 36 − 3	(14) 9545 − 512	(15) 767 − 64
(16) 7498 − 300	(17) 2189 − 183	(18) 288 − 12	(19) 68 − 6	(20) 3960 − 450
(21) 86 − 4	(22) 599 − 25	(23) 8356 − 332	(24) 7485 − 270	(25) 379 − 51

Process - Subtraction Raw Score_____
Skill - Subtraction with gaps--no borrowing

Test XII
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to findout how well you can subtract using two, three, and four place numbers. No borrowing is necessary.

Example A

39
4
35

When we subtract 4 from 39 the answer is 35 as shown in this example.

Example B

493
61

Work this problem before beginning the test.

---

(1) 27 − 4	(2) 193 − 81	(3) 3528 − 120	(4) 669 − 35	(5) 4750 − 600
(6) 487 − 50	(7) 2129 − 109	(8) 7589 − 516	(9) 783 − 32	(10) 164 − 11
(11) 349 − 24	(12) 79 − 7	(13) 1679 − 610	(14) 1343 − 300	(15) 578 − 57
(16) 25 − 3	(17) 5967 − 207	(18) 248 − 34	(19) 9986 − 382	(20) 36 − 5
(21) 2581 − 470	(22) 58 − 2	(23) 2479 − 421	(24) 927 − 13	(25) 765 − 42

Process - Subtraction Raw Score_____
Skill - Subtraction with gaps--no borrowing

Test XII
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can subtract using two, three, and four place numbers. No borrowing is necessary.

Example A

39
4
35

When we subtract 4 from 39 the answer is 35 as shown in the example.

Example B

493
61

Work this problem before beginning the test.

(1) 738 − 16	(2) 47 − 2	(3) 2578 − 370	(4) 78 − 5	(5) 494 − 54
(6) 9851 − 200	(7) 689 − 49	(8) 67 − 6	(9) 1384 − 381	(10) 520 − 10
(11) 5957 − 314	(12) 5462 − 260	(13) 192 − 62	(14) 89 − 1	(15) 7931 − 701
(16) 264 − 20	(17) 8998 − 247	(18) 273 − 33	(19) 7869 − 300	(20) 187 − 15
(21) 6577 − 401	(22) 145 − 32	(23) 56 − 4	(24) 3696 − 183	(25) 156 − 55

Process - Subtraction Raw Score_____
Skill - Subtraction with gaps--no borrowing

Test XII
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you can subtract using two, three, and four place numbers. No borrowing is necessary.

Example A

39
4
35

When we subtract 4 from 39 the answer is 35 as shown in this example.

Example B

493
61

Work this problem before beginning the test.

---

(1) 5875 − 120	(2) 516 − 13	(3) 45 − 4	(4) 799 − 85	(5) 449 − 36
(6) 23 − 1	(7) 397 − 30	(8) 6396 − 306	(9) 2879 − 772	(10) 669 − 59
(11) 1761 − 600	(12) 237 − 24	(13) 17 − 3	(14) 5728 − 503	(15) 342 − 21
(16) 548 − 46	(17) 4583 − 380	(18) 98 − 2	(19) 7584 − 251	(20) 1656 − 412
(21) 3794 − 170	(22) 15 − 5	(23) 598 − 40	(24) 362 − 12	(25) 2908 − 104

Process - Subtraction
Skill - One step borrowing, occasional vanishing lefts, and other difficulties

Raw Score_____

Test XIII
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you can subtract problems wih one step borrowing. Write your answers as quickly and accurately as you can.

Example A

44
27
17

When we subtract 27 from 44 the answer is 17 as shown in the example.

Example B

432
317

Work this problem before beginning the test.

(1)	90 14	(2)	184 106	(3)	20 16	(4)	429 165	(5)	638 209
(6)	90 2	(7)	861 343	(8)	95 29	(9)	82 78	(10)	80 37
(11)	967 608	(12)	981 249	(13)	490 75	(14)	948 78	(15)	847 483
(16)	965 756	(17)	575 368	(18)	91 62	(19)	570 290	(20)	80 63
(21)	45 27	(22)	273 56	(23)	834 725	(24)	80 61	(25)	853 109

Process - Subtraction
Skill - One-step borrowing, occasional vanishing lefts, and other difficulties

Raw Score_____

Test XIII
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you can subtract problems with one-step borrowing. Write your answers as quickly and accurately as you can.

Example A

$$\begin{array}{r} 44 \\ 27 \\ \hline 17 \end{array}$$

When we subtract 27 from 44 the answer is 17 as shown in this example.

Example B

$$\begin{array}{r} 432 \\ 317 \\ \hline \end{array}$$

Work this problem before beginning the test.

(1)	608 496	(2)	96 58	(3)	983 956	(4)	43 24	(5)	871 234
(6)	540 390	(7)	596 337	(8)	658 283	(9)	982 419	(10)	471 58
(11)	72 47	(12)	966 719	(13)	975 627	(14)	917 453	(15)	570 508
(16)	953 317	(17)	83 79	(18)	81 7	(19)	826 430	(20)	792 664
(21)	83 55	(22)	942 235	(23)	873 708	(24)	84 75	(25)	971 16

Process - Subtraction
Skill - One-step borrowing, occasional vanishing lefts, and other difficulties.

Raw Score_____

Test XIII
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out if you can subtract problems with one-step borrowing. Write your answers as quickly and accurately as you can.

Example A

44
27
17

When we subtract 27 from 44 the answer is 17 as shown in this example.

Example B

432
317

Work this problem before beginning the test.

---

(1)	83 44	(2)	567 419	(3)	724 390	(4)	46 17	(5)	942 661
(6)	80 43	(7)	520 280	(8)	91 78	(9)	931 50	(10)	972 904
(11)	45 28	(12)	590 238	(13)	708 413	(14)	60 46	(15)	681 159
(16)	983 68	(17)	723 653	(18)	875 17	(19)	94 29	(20)	569 497
(21)	94 38	(22)	93 46	(23)	275 36	(24)	636 608	(25)	938 170

Process - Subtraction
Skill - One-Step borrowing, occasional vanishing lefts, and other difficulties

Raw Score_____

Test XIII
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find outif you can subtract problems with one-step borrowing. Write your answers quickly and accurately as you can.

Example A

$$\begin{array}{r} 44 \\ 27 \\ \hline 17 \end{array}$$

When we subtract 27 from 44 the answer is 17 as shown in this example.

Example B

$$\begin{array}{r} 432 \\ 317 \\ \hline \end{array}$$

Work this problem before beginning the test.

---

(1)	85 38	(2)	83 29	(3)	51 13	(4)	70 25	(5)	31 12
(6)	610 409	(7)	578 159	(8)	44 7	(9)	80 12	(10)	695 159
(11)	321 15	(12)	642 37	(13)	67 28	(14)	983 176	(15)	734 482
(16)	596 69	(17)	584 108	(18)	731 27	(19)	605 445	(20)	72 3
(21)	81 46	(22)	91 24	(23)	20 7	(24)	72 36	(25)	394 315

Process - Subtraction
Skill - Double borrowing

Raw Score_____

Test XIV
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Example A

344
179
165

When we subtract 179 from 344 the answer is 165 as shown in this example.

Example B

640
453

Work this problem before beginning the test.

Directions to Pupils: This test is to find out if you know how to borrow in subtraction. Write the answers as quickly and accurately as you can.

---

(1)	430 249	(2)	701 398	(3)	9876 3197	(4)	631 435
(5)	7966 3589	(6)	671 197	(7)	702 494	(8)	5343 5167
(9)	775 278	(10)	4283 2647	(11)	923 476	(12)	312 193
(13)	6421 1254	(14)	825 547	(15)	5561 4778		

Process - Subtraction
Skill - Double Borrowing

Raw Score_____

Test XIV
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Example A		Example B	
344 179 165	When we subtract 179 from 344 the answer is 165 as shown in the example.	640 453	Work this problem before beginning the test.

Directions to Pupils: This test is to find out if you know how to borrow in subtraction. Write the answers as quickly and accurately as you can.

---

(1)	711 186	(2)	832 259	(3)	6546 4358	(4)	572 187
(5)	7342 6445	(6)	254 99	(7)	643 295	(8)	3433 3199
(9)	910 418	(10)	4534 2725	(11)	153 58	(12)	733 574
(13)	1340 181	(14)	654 295	(15)	2344 659		

Process - Subtraction
Skill - Double borrowing

Raw Score_____

Test XIV
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Example A		Example B	
344 179 165	When we subtract 179 from 344 the answer is 165 as shown in this example.	640 453	Work this problem before beginning the test.

Directions to Pupils: This test is to find out if you know how to borrow in subtraction. Write the answers as quickly and accurately as you can.

---

(1)	585 379	(2)	814 627	(3)	3315 1156	(4)	620 232
(5)	4221 2423	(6)	400 175	(7)	901 452	(8)	4651 4279
(9)	801 723	(10)	5065 2229	(11)	905 656	(12)	501 179
(13)	8804 3777	(14)	760 165	(15)	6081 3872		

Process - Subtraction
Skill - Double borrowing

Raw Score_____

Test XIV
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Example A

344
179
165

When we subtract 179 from 344 the answer is 165 as shown in this example.

Example B

640
453

Work this problem before beginning the test.

Directions to Pupils: This test is to find out if you know how borrow in subtraction. Write the answers as quickly and accurately as you can.

---

(1)	307 148	(2)	658 269	(3)	5800 3233	(4)	517 269
(5)	2734 1966	(6)	284 88	(7)	490 197	(8)	6912 6438
(9)	680 196	(10)	6172 5736	(11)	352 188	(12)	800 63
(13)	7437 6268	(14)	558 469	(15)	4187 1449		

THE COMMITTEE'S TEST

MULTIPLICATION

Process - Multiplication
Skills - Primary Facts and Reverses

Raw Score_____

Test XV
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you know the primary multiplication facts.

Example A

$$\begin{array}{r} 3 \\ \times\ 2 \\ \hline 6 \end{array}$$

When we multiply 2 times 3 the answer is 6 as shown in the example.

Example B

$$\begin{array}{r} 2 \\ \times\ 9 \\ \hline \end{array}$$

Work this problem before beginning the test.

---

(1) $\begin{array}{r} 6 \\ \times\ 0 \\ \hline \end{array}$	(2) $\begin{array}{r} 4 \\ \times\ 3 \\ \hline \end{array}$	(3) $\begin{array}{r} 7 \\ \times\ 9 \\ \hline \end{array}$	(4) $\begin{array}{r} 1 \\ \times\ 2 \\ \hline \end{array}$	(5) $\begin{array}{r} 2 \\ \times\ 4 \\ \hline \end{array}$
(6) $\begin{array}{r} 5 \\ \times\ 8 \\ \hline \end{array}$	(7) $\begin{array}{r} 2 \\ \times\ 2 \\ \hline \end{array}$	(8) $\begin{array}{r} 0 \\ \times\ 4 \\ \hline \end{array}$	(9) $\begin{array}{r} 6 \\ \times\ 7 \\ \hline \end{array}$	(10) $\begin{array}{r} 8 \\ \times\ 1 \\ \hline \end{array}$
(11) $\begin{array}{r} 8 \\ \times\ 3 \\ \hline \end{array}$	(12) $\begin{array}{r} 6 \\ \times\ 2 \\ \hline \end{array}$	(13) $\begin{array}{r} 9 \\ \times\ 5 \\ \hline \end{array}$	(14) $\begin{array}{r} 1 \\ \times\ 6 \\ \hline \end{array}$	(15) $\begin{array}{r} 0 \\ \times\ 0 \\ \hline \end{array}$
(16) $\begin{array}{r} 7 \\ \times\ 7 \\ \hline \end{array}$	(17) $\begin{array}{r} 2 \\ \times\ 8 \\ \hline \end{array}$	(18) $\begin{array}{r} 4 \\ \times\ 1 \\ \hline \end{array}$	(19) $\begin{array}{r} 4 \\ \times\ 7 \\ \hline \end{array}$	(20) $\begin{array}{r} 0 \\ \times\ 8 \\ \hline \end{array}$
(21) $\begin{array}{r} 3 \\ \times\ 6 \\ \hline \end{array}$	(22) $\begin{array}{r} 6 \\ \times\ 5 \\ \hline \end{array}$	(23) $\begin{array}{r} 5 \\ \times\ 4 \\ \hline \end{array}$	(24) $\begin{array}{r} 2 \\ \times\ 0 \\ \hline \end{array}$	(25) $\begin{array}{r} 9 \\ \times\ 8 \\ \hline \end{array}$

Process - Multiplication
Skills - Primary Facts and Reverses

Raw Score_____

Test XV
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you know the primary multiplication facts.

Example A

$$\begin{array}{r} 5 \\ \times\ 4 \\ \hline 20 \end{array}$$

When we multiply 4 times 5 the answer is 20 as shown in the example.

Example B

$$\begin{array}{r} 6 \\ \times\ 5 \\ \hline \end{array}$$

Work this problem before beginning the test.

---

(1) $\begin{array}{r} 3 \\ \times\ 7 \\ \hline \end{array}$	(2) $\begin{array}{r} 2 \\ \times\ 1 \\ \hline \end{array}$	(3) $\begin{array}{r} 0 \\ \times\ 3 \\ \hline \end{array}$	(4) $\begin{array}{r} 7 \\ \times\ 5 \\ \hline \end{array}$	(5) $\begin{array}{r} 4 \\ \times\ 4 \\ \hline \end{array}$
(6) $\begin{array}{r} 1 \\ \times\ 9 \\ \hline \end{array}$	(7) $\begin{array}{r} 0 \\ \times\ 1 \\ \hline \end{array}$	(8) $\begin{array}{r} 8 \\ \times\ 8 \\ \hline \end{array}$	(9) $\begin{array}{r} 3 \\ \times\ 2 \\ \hline \end{array}$	(10) $\begin{array}{r} 7 \\ \times\ 1 \\ \hline \end{array}$
(11) $\begin{array}{r} 6 \\ \times\ 8 \\ \hline \end{array}$	(12) $\begin{array}{r} 2 \\ \times\ 5 \\ \hline \end{array}$	(13) $\begin{array}{r} 5 \\ \times\ 0 \\ \hline \end{array}$	(14) $\begin{array}{r} 2 \\ \times\ 9 \\ \hline \end{array}$	(15) $\begin{array}{r} 8 \\ \times\ 7 \\ \hline \end{array}$
(16) $\begin{array}{r} 9 \\ \times\ 3 \\ \hline \end{array}$	(17) $\begin{array}{r} 0 \\ \times\ 7 \\ \hline \end{array}$	(18) $\begin{array}{r} 8 \\ \times\ 4 \\ \hline \end{array}$	(19) $\begin{array}{r} 5 \\ \times\ 9 \\ \hline \end{array}$	(20) $\begin{array}{r} 1 \\ \times\ 4 \\ \hline \end{array}$
(21) $\begin{array}{r} 5 \\ \times\ 3 \\ \hline \end{array}$	(22) $\begin{array}{r} 8 \\ \times\ 9 \\ \hline \end{array}$	(23) $\begin{array}{r} 7 \\ \times\ 2 \\ \hline \end{array}$	(24) $\begin{array}{r} 9 \\ \times\ 0 \\ \hline \end{array}$	(25) $\begin{array}{r} 4 \\ \times\ 6 \\ \hline \end{array}$

Process - Multiplication
Skills - Primary Facts and Reverses

Raw Score_____

Test XV
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you know the primary multiplication facts.

Example A

$$\begin{array}{r} 2 \\ \times\ 9 \\ \hline 18 \end{array}$$

When we multiply 9 times 2 the answer is 18 as shown in the example.

Example B

$$\begin{array}{r} 6 \\ \times\ 8 \\ \hline \end{array}$$

Work this problem before beginning the test.

---

(1) $\begin{array}{r} 5 \\ \times\ 2 \\ \hline \end{array}$	(2) $\begin{array}{r} 3 \\ \times\ 0 \\ \hline \end{array}$	(3) $\begin{array}{r} 7 \\ \times\ 4 \\ \hline \end{array}$	(4) $\begin{array}{r} 9 \\ \times\ 6 \\ \hline \end{array}$	(5) $\begin{array}{r} 6 \\ \times\ 1 \\ \hline \end{array}$
(6) $\begin{array}{r} 2 \\ \times\ 3 \\ \hline \end{array}$	(7) $\begin{array}{r} 6 \\ \times\ 3 \\ \hline \end{array}$	(8) $\begin{array}{r} 5 \\ \times\ 7 \\ \hline \end{array}$	(9) $\begin{array}{r} 9 \\ \times\ 2 \\ \hline \end{array}$	(10) $\begin{array}{r} 0 \\ \times\ 5 \\ \hline \end{array}$
(11) $\begin{array}{r} 9 \\ \times\ 9 \\ \hline \end{array}$	(12) $\begin{array}{r} 4 \\ \times\ 5 \\ \hline \end{array}$	(13) $\begin{array}{r} 1 \\ \times\ 8 \\ \hline \end{array}$	(14) $\begin{array}{r} 0 \\ \times\ 9 \\ \hline \end{array}$	(15) $\begin{array}{r} 7 \\ \times\ 8 \\ \hline \end{array}$
(16) $\begin{array}{r} 3 \\ \times\ 4 \\ \hline \end{array}$	(17) $\begin{array}{r} 7 \\ \times\ 0 \\ \hline \end{array}$	(18) $\begin{array}{r} 3 \\ \times\ 1 \\ \hline \end{array}$	(19) $\begin{array}{r} 5 \\ \times\ 5 \\ \hline \end{array}$	(20) $\begin{array}{r} 7 \\ \times\ 6 \\ \hline \end{array}$
(21) $\begin{array}{r} 1 \\ \times\ 0 \\ \hline \end{array}$	(22) $\begin{array}{r} 3 \\ \times\ 8 \\ \hline \end{array}$	(23) $\begin{array}{r} 9 \\ \times\ 4 \\ \hline \end{array}$	(24) $\begin{array}{r} 1 \\ \times\ 5 \\ \hline \end{array}$	(25) $\begin{array}{r} 2 \\ \times\ 7 \\ \hline \end{array}$

Process - Multiplication
Skills - Primary Facts and Reverses

Raw Score_____

Test XV
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This test is to find out how well you know the primary multiplication facts.

Example A

$\begin{array}{r} 4 \\ \times\ 8 \\ \hline 32 \end{array}$

When we multiply 8 times 4 the answer is 32 as shown in the example.

Example B

$\begin{array}{r} 7 \\ \times\ 6 \\ \hline \end{array}$

Work this problem before beginning the test.

---

(1) $\begin{array}{r} 6 \\ \times\ 4 \\ \hline \end{array}$	(2) $\begin{array}{r} 9 \\ \times\ 1 \\ \hline \end{array}$	(3) $\begin{array}{r} 0 \\ \times\ 2 \\ \hline \end{array}$	(4) $\begin{array}{r} 3 \\ \times\ 3 \\ \hline \end{array}$	(5) $\begin{array}{r} 8 \\ \times\ 6 \\ \hline \end{array}$
(6) $\begin{array}{r} 3 \\ \times\ 9 \\ \hline \end{array}$	(7) $\begin{array}{r} 8 \\ \times\ 2 \\ \hline \end{array}$	(8) $\begin{array}{r} 1 \\ \times\ 1 \\ \hline \end{array}$	(9) $\begin{array}{r} 7 \\ \times\ 3 \\ \hline \end{array}$	(10) $\begin{array}{r} 9 \\ \times\ 7 \\ \hline \end{array}$
(11) $\begin{array}{r} 1 \\ \times\ 7 \\ \hline \end{array}$	(12) $\begin{array}{r} 2 \\ \times\ 6 \\ \hline \end{array}$	(13) $\begin{array}{r} 8 \\ \times\ 5 \\ \hline \end{array}$	(14) $\begin{array}{r} 6 \\ \times\ 6 \\ \hline \end{array}$	(15) $\begin{array}{r} 8 \\ \times\ 0 \\ \hline \end{array}$
(16) $\begin{array}{r} 3 \\ \times\ 5 \\ \hline \end{array}$	(17) $\begin{array}{r} 4 \\ \times\ 9 \\ \hline \end{array}$	(18) $\begin{array}{r} 1 \\ \times\ 3 \\ \hline \end{array}$	(19) $\begin{array}{r} 4 \\ \times\ 8 \\ \hline \end{array}$	(20) $\begin{array}{r} 4 \\ \times\ 0 \\ \hline \end{array}$
(21) $\begin{array}{r} 6 \\ \times\ 9 \\ \hline \end{array}$	(22) $\begin{array}{r} 4 \\ \times\ 2 \\ \hline \end{array}$	(23) $\begin{array}{r} 5 \\ \times\ 1 \\ \hline \end{array}$	(24) $\begin{array}{r} 0 \\ \times\ 6 \\ \hline \end{array}$	(25) $\begin{array}{r} 5 \\ \times\ 6 \\ \hline \end{array}$

Process - Multiplication Raw Score_____
Skill - One Place Multiplier - No Carrying

Test XVI
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by one number. There is no carrying. Be sure to do the very best you can.

Example A

$$\begin{array}{r} 23 \\ \times\ 2 \\ \hline 46 \end{array}$$

When we multiply 23 by 2 the answer is 46 as shown in this example.

Example B

$$\begin{array}{r} 101 \\ \times\ 6 \end{array}$$

Work this problem before beginning the test.

---

(1) $\begin{array}{r} 33 \\ \times\ 3 \end{array}$	(2) $\begin{array}{r} 20 \\ \times\ 5 \end{array}$	(3) $\begin{array}{r} 71 \\ \times\ 9 \end{array}$	(4) $\begin{array}{r} 30 \\ \times\ 3 \end{array}$	(5) $\begin{array}{r} 41 \\ \times\ 2 \end{array}$
(6) $\begin{array}{r} 90 \\ \times\ 8 \end{array}$	(7) $\begin{array}{r} 41 \\ \times\ 4 \end{array}$	(8) $\begin{array}{r} 10 \\ \times\ 5 \end{array}$	(9) $\begin{array}{r} 51 \\ \times\ 9 \end{array}$	(10) $\begin{array}{r} 300 \\ \times\ 4 \end{array}$
(11) $\begin{array}{r} 501 \\ \times\ 2 \end{array}$	(12) $\begin{array}{r} 71 \\ \times\ 7 \end{array}$	(13) $\begin{array}{r} 44 \\ \times\ 2 \end{array}$	(14) $\begin{array}{r} 11 \\ \times\ 5 \end{array}$	(15) $\begin{array}{r} 510 \\ \times\ 4 \end{array}$
(16) $\begin{array}{r} 31 \\ \times\ 6 \end{array}$	(17) $\begin{array}{r} 80 \\ \times\ 7 \end{array}$	(18) $\begin{array}{r} 21 \\ \times\ 8 \end{array}$	(19) $\begin{array}{r} 90 \\ \times\ 6 \end{array}$	(20) $\begin{array}{r} 37 \\ \times\ 1 \end{array}$
(21) $\begin{array}{r} 210 \\ \times\ 3 \end{array}$	(22) $\begin{array}{r} 63 \\ \times\ 2 \end{array}$	(23) $\begin{array}{r} 701 \\ \times\ 5 \end{array}$	(24) $\begin{array}{r} 51 \\ \times\ 2 \end{array}$	(25) $\begin{array}{r} 16 \\ \times\ 1 \end{array}$

Process - Multiplication Raw Score_____
Skills - One Place Multiplier - No Carrying

Test XVI
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to pupils: This is a test to see how well you can multiply by one number. There is no carrying. Be sure to do the very best you can.

Example A

23
2
46

When we multiply 23 by 2 the answer is 46 as shown in this example.

Example B

101
6

Work this problem before beginning the test.

---

(1) 20 × 2	(2) 81 × 4	(3) 72 × 2	(4) 402 × 3	(5) 92 × 4
(6) 800 × 8	(7) 71 × 4	(8) 30 × 8	(9) 53 × 3	(10) 61 × 6
(11) 43 × 2	(12) 41 × 6	(13) 211 × 9	(14) 20 × 5	(15) 61 × 7
(16) 81 × 5	(17) 50 × 6	(18) 31 × 7	(19) 80 × 3	(20) 914 × 2
(21) 41 × 1	(22) 310 × 7	(23) 10 × 6	(24) 32 × 4	(25) 92 × 3

Process - Multiplication Raw Score_____
Skill - One Place Multiplier--No Carrying

Test XVI
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by one number. There is no carrying. Be sure to do the very best you can.

Example A

$$\begin{array}{r} 23 \\ \times\ 2 \\ \hline 46 \end{array}$$

When we multiply 23 by 2 the answer is 46 as shown in this example.

Example B

$$\begin{array}{r} 101 \\ \times\ 6 \end{array}$$

Work this problem before beginning the test.

---

(1) $\begin{array}{r} 82 \\ \times\ 2 \end{array}$	(2) $\begin{array}{r} 41 \\ \times\ 3 \end{array}$	(3) $\begin{array}{r} 600 \\ \times\ 3 \end{array}$	(4) $\begin{array}{r} 31 \\ \times\ 8 \end{array}$	(5) $\begin{array}{r} 90 \\ \times\ 7 \end{array}$
(6) $\begin{array}{r} 13 \\ \times\ 3 \end{array}$	(7) $\begin{array}{r} 51 \\ \times\ 7 \end{array}$	(8) $\begin{array}{r} 80 \\ \times\ 9 \end{array}$	(9) $\begin{array}{r} 41 \\ \times\ 5 \end{array}$	(10) $\begin{array}{r} 39 \\ \times\ 1 \end{array}$
(11) $\begin{array}{r} 210 \\ \times\ 5 \end{array}$	(12) $\begin{array}{r} 61 \\ \times\ 9 \end{array}$	(13) $\begin{array}{r} 30 \\ \times\ 4 \end{array}$	(14) $\begin{array}{r} 71 \\ \times\ 8 \end{array}$	(15) $\begin{array}{r} 90 \\ \times\ 4 \end{array}$
(16) $\begin{array}{r} 11 \\ \times\ 7 \end{array}$	(17) $\begin{array}{r} 90 \\ \times\ 5 \end{array}$	(18) $\begin{array}{r} 222 \\ \times\ 2 \end{array}$	(19) $\begin{array}{r} 50 \\ \times\ 4 \end{array}$	(20) $\begin{array}{r} 91 \\ \times\ 9 \end{array}$
(21) $\begin{array}{r} 23 \\ \times\ 2 \end{array}$	(22) $\begin{array}{r} 111 \\ \times\ 6 \end{array}$	(23) $\begin{array}{r} 70 \\ \times\ 7 \end{array}$	(24) $\begin{array}{r} 31 \\ \times\ 3 \end{array}$	(25) $\begin{array}{r} 201 \\ \times\ 6 \end{array}$

Process - Multiplication Raw Score_____
Skill - One Place Multiplier--No Carrying

Test XVI
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by one number. There is no carrying. Be sure to do the very best you can.

Example A

$$\begin{array}{r} 23 \\ \times\ 2 \\ \hline 46 \end{array}$$

When we multiply 23 by 2 the answer is 46 as shown in this example.

Example B

$$\begin{array}{r} 101 \\ \times\ 6 \end{array}$$

Work this problem before beginning the test.

---

(1)	41 × 8	(2)	20 × 7	(3)	11 × 4	(4)	14 × 2	(5)	311 × 9
(6)	512 × 1	(7)	41 × 7	(8)	62 × 4	(9)	70 × 8	(10)	51 × 5
(11)	82 × 3	(12)	54 × 2	(13)	31 × 5	(14)	70 × 6	(15)	412 × 2
(16)	20 × 9	(17)	702 × 3	(18)	51 × 8	(19)	90 × 1	(20)	61 × 5
(21)	75 × 1	(22)	83 × 3	(23)	40 × 9	(24)	621 × 2	(25)	81 × 6

Process - Multiplication Raw Score_____
Skill - One Place multiplier, carrying requiring addition in same decade and to a higher decade.

Test XVII
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by one number, when there is carrying. Be sure to do the very best you can.

Example A

523
× 7
3,661

When we multiply 523 by 7 the answer is 3,661 as shown in the example.

Example B

1467
× 3

Work this problem before beginning the test.

---

(1)	721 × 8	(2)	7942 × 5	(3)	8152 × 7	(4)	6433 × 3
(5)	6198 × 9	(6)	885 × 2	(7)	3192 × 6	(8)	9782 × 1
(9)	4135 × 4	(10)	621 × 2	(11)	57 × 9	(12)	79 × 7
(13)	6349 × 8	(14)	8476 × 6	(15)	8635 × 5	(16)	6291 × 4
(17)	2581 × 3	(18)	3224 × 9	(19)	3642 × 7	(20)	853 × 8

Process - Multiplication Raw Score_____
Skill - One place multiplier, carrying requiring addition in same decade and to a higher decade.

Test XVII
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by one number, when there is carrying. Be sure to do the very best you can.

Example A
523 × 7 = 3,661
When we multiply 523 by 7 the answer is 3,661 as shown in the example.

Example B
1476 × 3
Work this problem before beginning the test.

(1)	1654 × 1	(2)	8726 × 6	(3)	3254 × 9	(4)	7198 × 4
(5)	3684 × 8	(6)	9258 × 3	(7)	8135 × 5	(8)	6422 × 7
(9)	9497 × 2	(10)	1675 × 9	(11)	5834 × 4	(12)	917 × 8
(13)	8956 × 7	(14)	9427 × 5	(15)	1395 × 6	(16)	7643 × 3
(17)	3865 × 2	(17)	371 × 7	(19)	918 × 9	(20)	57 × 8

Process - Multiplication Raw Score_____
Skill - One place multiplier, carrying requiring addition in same decade and to a higher decade.

Test XVII
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to pupils: This is a test to see how well you can multiply by one number, when there is carrying. Be sure to do the very best you can.

Example A

523
× 7
3,661

When we multiply 523 by 7 the answer is 3,661 as shown in the example.

Example B

1467
× 3

Work this problem before beginning the test.

---

(1)	3254 × 9	(2)	4937 × 2	(3)	1892 × 4	(4)	4853 × 6
(5)	8135 × 5	(6)	1854 × 1	(7)	9825 × 3	(8)	4368 × 8
(9)	6342 × 7	(10)	8769 × 6	(11)	2687 × 9	(12)	893 × 7
(13)	7968 × 5	(14)	8627 × 8	(15)	9837 × 3	(16)	9865 × 2
(17)	6467 × 4	(18)	2349 × 8	(19)	4396 × 9	(20)	5476 × 7

Process - Multiplication Raw Score_____
Skill - One place multiplier, carrying requiring addition in same decade and to a higher decade.

Test XVII
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by one number, when there is carrying. Be sure to do the very best you can.

Example A
523
7
3,661
When we multiply 523 by 7 the answer is 3,661 as shown in the example.

Example B
1467
3
Work this problem before beginning the test.

---

(1)	1392 6	(2)	1473 3	(3)	8952 7	(4)	4972 5
(5)	2971 8	(6)	4513 4	(7)	5638 5	(8)	968 8
(9)	6175 9	(10)	8967 9	(11)	6251 2	(12)	897 4
(13)	4389 9	(14)	5499 6	(15)	7869 3	(16)	9487 2
(17)	6178 7	(18)	8374 8	(19)	6794 7	(20)	3787 6

Process - Multiplication Raw Score_____
Skill - Zero in multiplicand, with and without carrying to zero.

Test XVIII
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by one number with a zero in the multiplicand, with and without carrying to the zero. Be sure to do the very best you can.

Example A

320 × 2 = 640

When we multiply 320 by 2 the answer is 640 as shown in the example.

Example B

1070 × 4

Work this problem before beginning the test.

---

(1) 7040 × 6	(2) 908 × 3	(3) 609 × 8	(4) 290 × 5	(5) 4207 × 2
(6) 2048 × 4	(7) 390 × 7	(8) 6004 × 1	(9) 807 × 9	(10) 1390 × 4
(11) 2801 × 8	(12) 1950 × 6	(13) 1047 × 3	(14) 1609 × 2	(15) 3017 × 5
(16) 2905 × 9	(17) 4017 × 7	(18) 503 × 8	(19) 1807 × 1	(20) 2036 × 3
(21) 3082 × 6	(22) 7860 × 4	(23) 8062 × 7	(24) 540 × 5	(25) 3601 × 9

Process - Multiplication
Skill - Zero in multiplicand, with and without carrying to zero.

Raw Score_____

Test XVIII
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by one number with a zero in the multiplicand, with and without carrying to the zero. Be sure to do the very best you can.

Example A

320
× 2
640

When we multiply 320 by 2 the answer is 640 as shown in the example.

Example B

1070
× 4

Work this problem before beginning the test.

---

(1) 308 × 7	(2) 160 × 3	(3) 4072 × 5	(4) 950 × 8	(5) 2530 × 4
(6) 7406 × 6	(7) 850 × 9	(8) 4308 × 2	(9) 1602 × 1	(10) 6041 × 9
(11) 302 × 3	(12) 801 × 6	(13) 9010 × 5	(14) 702 × 8	(15) 7012 × 2
(16) 6014 × 4	(17) 2507 × 7	(18) 4007 × 1	(19) 2079 × 9	(20) 9305 × 6
(21) 7504 × 3	(22) 8603 × 5	(23) 6401 × 7	(24) 1403 × 8	(25) 8097 × 4

Process - Multiplication
Skill - Zero in multiplicand, with and without carrying to zero.

Raw Score_____

Test XVIII
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by one number with a zero in the multiplicand, with and without carrying to the zero. Be sure to do the very best you can.

Example A

320 × 2 = 640

When we multiply 320 by 2 the answer is 640 as shown in the example.

Example B

1070 × 4

Work this problem before beginning the test.

---

(1) 450 × 5	(2) 4060 × 9	(3) 703 × 1	(4) 7082 × 7	(5) 1905 × 4
(6) 6027 × 6	(7) 2380 × 3	(8) 509 × 8	(9) 4006 × 2	(10) 609 × 1
(11) 4063 × 8	(12) 6504 × 3	(13) 1650 × 7	(14) 840 × 4	(15) 5107 × 9
(16) 8029 × 2	(17) 305 × 6	(18) 9070 × 5	(19) 390 × 7	(20) 2809 × 9
(21) 7091 × 3	(22) 8170 × 8	(23) 7603 × 4	(24) 9018 × 6	(25) 8306 × 5

Process - Multiplication
Skill - Zero in Multiplicand, with and without carrying to zero.

Raw Score_____

Test XVIII
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by one number with a zero in the multiplicand, with and without carrying to the zero. Be sure to do the very best you can.

Example A

320
× 2
640

When we multiply 320 by 2 the answer is 640 as shown in the example.

Example B

1070
× 4

Work this problem before beginning the test.

(1) 608 × 5	(2) 8063 × 7	(3) 8009 × 1	(4) 570 × 4	(5) 1409 × 8
(6) 9002 × 2	(7) 840 × 6	(8) 7205 × 3	(9) 390 × 9	(10) 8030 × 4
(11) 4706 × 7	(12) 806 × 2	(13) 750 × 1	(14) 7059 × 5	(15) 1408 × 9
(16) 6080 × 3	(17) 9076 × 6	(18) 3706 × 8	(19) 902 × 7	(20) 5082 × 8
(21) 3904 × 3	(22) 4130 × 5	(23) 5070 × 9	(24) 9604 × 4	(25) 5013 × 6

Process - Multiplication Raw Score_____
Skill - Two or three place multipliers--no carrying

Test XIX
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by two and three place multipliers. There is no carrying. Be sure to do the very best you can.

Example A

```
 112
  31
3472
```

When we multiply 112 by 31 the answer is 3472 as shown in this example.

Example B

```
 842
  21
```

Work this problem before beginning the test.

---

(1)	941 21	(2)	52 33	(3)	712 414	(4)	213 32
(5)	23 13	(6)	932 323	(7)	83 23	(8)	432 33
(9)	731 323	(10)	910 679	(11)	821 43	(12)	62 42
(13)	83 23	(14)	723 332	(15)	601 79	(16)	932 32
(17)	501 248	(18)	921 41	(19)	850 111	(20)	13 32

Process - Multiplication Raw Score_____
Skill - Two or three place multipliers--no carrying

Test XIX
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by two and three place multipliers. There is no carrying. Be sure to do the very best you can.

Example A

112
31
3472

When we multiply 112 by 31 the answer is 3472 as shown in this example.

Example B

842
21

Work this problem before beginning the test.

---

(1)	510 95	(2)	81 65	(3)	601 54	(4)	800 586
(5)	73 12	(6)	741 212	(7)	821 24	(8)	630 13
(9)	61 49	(10)	610 258	(11)	711 65	(12)	45 11
(13)	632 31	(14)	204 222	(15)	50 76	(16)	13 21
(17)	401 68	(18)	71 53	(19)	921 243	(20)	711 87

Process - Multiplication Raw Score_____
Skill - Two or three place multipliers--no carrying

Test XIX
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by two and three place multipliers. There is no carrying. Be sure to do the very best you can.

Example A

112
31
3472

When we multiply 112 by 31 the answer is 3472 as shown in this example.

Example B

842
21

Work this problem before beginning the test.

---

(1)	601 797	(2)	41 32	(3)	721 43	(4)	40 98
(5)	521 14	(6)	531 323	(7)	613 32	(8)	841 212
(9)	24 22	(10)	28 11	(11)	832 13	(12)	713 323
(13)	12 24	(14)	921 44	(15)	610 58	(16)	600 87
(17)	524 22	(18)	910 765	(19)	93 23	(20)	810 596

Process - Multiplication Raw Score_____
Skill - Two and three place multipliers--no carrying

Test XIX
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by two and three place multipliers. There is no carrying. Be sure to do the very best you can.

Example A

112
31
3472

When we multiply 112 by 31 the answer is 3472 as shown in this example.

Example B

842
21

Work this problem before beginning the test.

---

(1)	82 34	(2)	810 75	(3)	931 233	(4)	501 96
(5)	93 23	(6)	622 432	(7)	610 867	(8)	64 12
(9)	630 32	(10)	40 56	(11)	704 212	(12)	732 33
(13)	400 97	(14)	71 45	(15)	412 234	(16)	820 443
(17)	50 79	(18)	412 24	(19)	71 69	(20)	911 78

Process - Multiplication Raw Score_____
Skill - Two or three place multiplier--with carrying

Test XX
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by two and three place multipliers. There is carrying. Be sure to do the very best you can.

Example A

48
23
1104

When we multiply 48 by 23 the answer is 1104 as shown in this example.

Example B

742
74

Work this problem before beginning the test.

---

(1)	92 71	(2)	567 999	(3)	24 89	(4)	85 42
(5)	437 45	(6)	747 236	(7)	821 74	(8)	938 358
(9)	276 56	(10)	59 87	(11)	634 78	(12)	536 621
(13)	78 51	(14)	893 69	(15)	78 87	(16)	24 58
(17)	359 53	(18)	699 324	(19)	865 45	(20)	29 17

Process - Multiplication Raw Score_____
Skill - Two or three place multiplier--with carrying

Test XX
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by two and three place multipliers. There is carrying. Be sure to do the very best you can.

Example A

48
23
1104

When we multiply 48 by 23 the answer is 1104 as shown in this example.

Example B

742
74

Work this problem before beginning the test.

---

(1)	84 16	(2)	48 16	(3)	557 554	(4)	67 58
(5)	76 63	(6)	553 167	(7)	69 57	(8)	96 47
(9)	628 758	(10)	857 268	(11)	85 18	(12)	58 81
(13)	686 853	(14)	33 99	(15)	333 999	(16)	67 55
(17)	643 555	(18)	115 99	(19)	171 99	(20)	133 44

Process - Multiplication Raw Score_____
Skill - Two or three place multiplier--with carrying

Test XX
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by two and three place multipliers. There is carrying. Be sure to do the very best you can.

Example A

48
23
1104

When we multiply 48 by 23 the answer is 1104 as shown in this example.

Example B

742
74

Work this problem before beginning the test.

---

(1)	369 25	(2)	47 28	(3)	281 37	(4)	536 469
(5)	79 84	(6)	854 372	(7)	668 65	(8)	732 49
(9)	915 281	(10)	57 75	(11)	49 96	(12)	803 87
(13)	670 263	(14)	492 85	(15)	638 79	(16)	567 83
(17)	709 177	(18)	428 68	(19)	149 459	(20)	908 43

Process - Multiplication Raw Score_____
Skill - Two or three place multiplier--with carrying

Test XX
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply by two and three place multipliers. There is carrying. Be sure to do the very best you can.

Example A

48
23
1104

When we multiply 48 by 23 the answer is 1104 as shown in this example.

Example B

742
74

Work this problem before beginning the test.

(1)	14 83	(2)	358 256	(3)	67 74	(4)	892 19
(5)	95 27	(6)	68 57	(7)	420 67	(8)	348 734
(9)	274 98	(10)	46 56	(11)	379 958	(12)	56 98
(13)	72 75	(14)	789 644	(15)	89 38	(16)	765 32
(17)	59 43	(18)	509 65	(19)	462 389	(20)	371 26

Process - Multiplication Raw Score_____
Skill - One or two zeros in the multiplier
Test XXI
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply when there is a zero in the multiplier. Be sure to do the very best you can.

Example A

425
20
8500

When we multiply 425 by 20 the answer is 8500 as shown in this example.

Example B

3875
305

Work this problem before beginning the test.

---

(1) 6347 × 390

(2) 9582 × 708

(3) 7083 × 260

(4) 968 × 470

(5) 5370 × 90

(6) 1692 × 590

(7) 8574 × 860

(8) 5008 × 970

(9) 3976 × 700

(10) 746 × 850

Process - Multiplication Raw Score_____
Skill - One or two zeros in the multiplier

Test XXI
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to seehow well you can multiply when there is a zero in the multiplier. Be sure to do the very best you can.

Example A

425
20
8500

When we multiply 425 by 20 the answer is 8500 as shown in this example.

Example B

3875
305

Work this problem before beginning the test.

---

(1) 7183 × 80

(2) 3859 × 470

(3) 4526 × 580

(4) 6749 × 760

(5) 9305 × 500

(6) 7359 × 390

(7) 640 × 980

(8) 5296 × 270

(9) 2478 × 609

(10) 8967 × 950

Process - Multiplication Raw Score_____
Skill - One or two zeros in the multiplier

Test XXI
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply when there is a zero in the multiplier. Be sure to do the very best you can.

Example A

425
20
8500

When we multiply 425 by 20 the answer is 8500 as shown in this example.

Example B

3875
305

Work this problem before beginning the test.

---

(1) 568 × 360

(2) 2957 × 880

(3) 8495 × 890

(4) 9374 × 570

(5) 1829 × 706

(6) 9064 × 80

(7) 753 × 600

(8) 3870 × 810

(9) 3687 × 270

(10) 2479 × 490

Process - Multiplication Raw Score_____
Skill - One or two zeros in the multiplier

Test XXI
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can multiply when there is a zero in the multiplier. Be sure to do the very best you can.

Example A

425
20
8500

When we multiply 425 by 20 the answer is 8500 as shown in this example.

Example B

3875
305

Work this problem before beginning the test.

---

(1) 794 × 650

(2) 9387 × 930

(3) 6907 × 850

(4) 6857 × 740

(5) 2768 × 900

(6) 8715 × 570

(7) 968 × 760

(8) 6492 × 407

(9) 6359 × 90

(10) 4085 × 680

THE COMMITTEE'S TEST

SHORT DIVISION

Process - Short Division Raw Score_____
Skill - Primary even facts--Primary uneven facts

Test XXII
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see if you know the primary facts of short division. There are even division facts as well as uneven division facts in this test. Be sure to do the very best you can.

Example A

$7\overline{)14}$ = 2 When we divide 14 by 7 the answer is 2 as shown in this example.

Example B

$8\overline{)47}$ Work this problem before beginning the test.

---

(1) $2\overline{)4}$	(2) $4\overline{)11}$	(3) $8\overline{)33}$	(4) $6\overline{)1}$
(5) $3\overline{)0}$	(6) $9\overline{)18}$	(7) $7\overline{)69}$	(8) $5\overline{)26}$
(9) $6\overline{)36}$	(10) $2\overline{)15}$	(11) $3\overline{)29}$	(12) $4\overline{)31}$
(13) $9\overline{)27}$	(14) $5\overline{)36}$	(15) $6\overline{)55}$	(16) $9\overline{)73}$
(17) $7\overline{)7}$	(18) $2\overline{)7}$	(19) $8\overline{)45}$	(20) $3\overline{)17}$
(21) $7\overline{)18}$	(22) $5\overline{)49}$	(23) $4\overline{)27}$	(24) $5\overline{)45}$
(25) $6\overline{)44}$			

Process - Short Division Raw Score_____
Skill - Primary even facts--Primary uneven facts

Test XXII
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see if you know the primary facts of short division. There are even division facts as well as uneven division facts in this test. Be sure to do the very best you can.

Example A

$7\overline{)14}$ = 2 When we divide 14 by 7 the answer is 2 as shown in this example.

Example B

$8\overline{)47}$ Work this problem before beginning the test.

---

(1) $1\overline{)9}$ (2) $9\overline{)31}$ (3) $6\overline{)16}$ (4) $8\overline{)15}$

(5) $6\overline{)24}$ (6) $2\overline{)19}$ (7) $7\overline{)36}$ (8) $5\overline{)19}$

(9) $4\overline{)24}$ (10) $9\overline{)44}$ (11) $3\overline{)8}$ (12) $4\overline{)35}$

(13) $8\overline{)56}$ (14) $9\overline{)64}$ (15) $7\overline{)58}$ (16) $6\overline{)29}$

(17) $5\overline{)0}$ (18) $9\overline{)17}$ (19) $8\overline{)65}$ (20) $4\overline{)22}$

(21) $3\overline{)13}$ (22) $7\overline{)17}$ (23) $6\overline{)37}$ (24) $3\overline{)18}$

(25) $5\overline{)48}$

Process - Short Division Raw Score_____
Skill - Primary even facts - Primary uneven facts
Form C
Test XXII

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see if you know the primary facts of short division. There are even division facts as well as uneven division facts in this test. Be sure to do the very best you can.

Example A

$7\overline{)14}$ $\frac{2}{}$ When we divide 14 by 7 the answer is 2 as shown in this example.

Example B

$8\overline{)47}$ Work this problem before beginning the test.

---

(1) $4\overline{)16}$	(2) $9\overline{)81}$	(3) $8\overline{)58}$	(4) $3\overline{)26}$
(5) $7\overline{)28}$	(6) $6\overline{)31}$	(7) $3\overline{)4}$	(8) $5\overline{)1}$
(9) $8\overline{)25}$	(10) $4\overline{)18}$	(11) $7\overline{)47}$	(12) $5\overline{)5}$
(13) $1\overline{)1}$	(14) $2\overline{)13}$	(15) $9\overline{)11}$	(16) $7\overline{)24}$
(17) $9\overline{)81}$	(18) $4\overline{)39}$	(19) $5\overline{)17}$	(20) $8\overline{)75}$
(21) $6\overline{)14}$	(22) $3\overline{)11}$	(23) $2\overline{)3}$	(24) $6\overline{)48}$
(25) $9\overline{)37}$			

Process - Short Division Raw Score_____
Skill - Primary even facts - Primary uneven facts

Test XXII
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see if you know the primary facts of short division. There are even division facts as well as uneven division facts in this test. Be sure to do the very best you can.

Example A

$7\overline{)14}$ $\quad 2$ When we divide 14 by 7 the answer is 2 as shown in this example.

Example B

$8\overline{)47}$ Work this problem before beginning the test.

---

(1) $3\overline{)15}$ (2) $9\overline{)50}$ (3) $4\overline{)29}$ (4) $5\overline{)14}$

(5) $7\overline{)0}$ (6) $2\overline{)17}$ (7) $8\overline{)53}$ (8) $9\overline{)32}$

(9) $6\overline{)30}$ (10) $5\overline{)39}$ (11) $3\overline{)23}$ (12) $6\overline{)49}$

(13) $9\overline{)63}$ (14) $7\overline{)44}$ (15) $8\overline{)7}$ (16) $7\overline{)66}$

(17) $4\overline{)36}$ (18) $6\overline{)26}$ (19) $3\overline{)20}$ (20) $9\overline{)79}$

(21) $6\overline{)33}$ (22) $4\overline{)14}$ (23) $5\overline{)29}$ (24) $8\overline{)64}$

(25) $2\overline{)11}$

Process - Short Division
Skill - No carrying, with and without remainders.

Raw Score_____

Test XXIII
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can do short division. There is no carrying in these problems. Some of the problems have remainders. Be sure to do the very best you can.

Example A

$6\overline{)660}$ When we divide 660 by 6 the answer is 110 as shown in this example.

Example B

$4\overline{)1241}$ Work this problem before beginning the test.

---

(1) $3\overline{)93}$ (2) $7\overline{)350}$ (3) $9\overline{)459}$ (4) $8\overline{)568}$

(5) $6\overline{)3660}$ (6) $4\overline{)1684}$ (7) $5\overline{)3550}$ (8) $6\overline{)541}$

(9) $2\overline{)608}$ (10) $8\overline{)488}$ (11) $9\overline{)5491}$ (12) $2\overline{)1449}$

(13) $5\overline{)457}$ (14) $7\overline{)286}$ (15) $2\overline{)102}$ (16) $4\overline{)244}$

(17) $9\overline{)6390}$ (18) $8\overline{)1680}$ (19) $3\overline{)151}$ (20) $7\overline{)5670}$

Process - Short Division
Skill - No carrying, with and without remainders.

Raw Score_____

Test XXIII
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can do short division. There is no carrying in these problems. Some of the problems have remainders. Be sure to do the very best you can.

Example A

$6\overline{)660}$ $\quad 110$

When we divide 660 by 6 the answer is 110 as shown in this example.

Example B

$4\overline{)1241}$

Work this problem before beginning the test.

---

(1) $7\overline{)499}$ (2) $3\overline{)1296}$ (3) $6\overline{)1861}$ (4) $5\overline{)1055}$

(5) $4\overline{)1684}$ (6) $2\overline{)6842}$ (7) $8\overline{)3289}$ (8) $9\overline{)549}$

(9) $7\overline{)4278}$ (10) $8\overline{)569}$ (11) $9\overline{)7290}$ (12) $4\overline{)2048}$

(13) $5\overline{)3957}$ (14) $6\overline{)5467}$ (15) $3\overline{)9963}$ (16) $7\overline{)4977}$

(17) $8\overline{)6489}$ (18) $6\overline{)426}$ (19) $8\overline{)4089}$ (20) $3\overline{)1206}$

Process - Short Division
Skill - No carrying, with and without remainders.

Raw Score_____

Test XXIII
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can do short division. There is no carrying in these problems. Some of the problems have remainders. Be sure to do the very best you can.

Example A

$6\overline{)660}$ = 110

When we divide 660 by 6 the answer is 110 as shown in this example.

Example B

$4\overline{)1241}$

Work this problem before beginning the test.

---

(1) $2\overline{)4826}$ (2) $6\overline{)2467}$ (3) $7\overline{)637}$ (4) $9\overline{)2790}$

(5) $3\overline{)1890}$ (6) $5\overline{)2555}$ (7) $4\overline{)2848}$ (8) $8\overline{)6489}$

(9) $2\overline{)468}$ (10) $3\overline{)693}$ (11) $9\overline{)3609}$ (12) $8\overline{)408}$

(13) $6\overline{)546}$ (14) $5\overline{)59}$ (15) $4\overline{)3248}$ (16) $7\overline{)497}$

(17) $8\overline{)488}$ (18) $4\overline{)848}$ (19) $8\overline{)4089}$ (20) $9\overline{)8196}$

Process - Short Division
Skill - No carrying, with and without remainders.

Raw Score_____

Test XXIII
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can do short division. There is no carrying in these problems. Some of the problems have remainders. Be sure to do the very best you can.

Example A

$6\overline{)660}$ $\quad 110$

When we divide 660 by 6 the answer is 110 as shown in this example.

Example B

$4\overline{)1241}$

Work this problem before beginning the test.

---

(1) $3\overline{)2769}$ (2) $9\overline{)810}$ (3) $5\overline{)355}$ (4) $8\overline{)569}$

(5) $2\overline{)1862}$ (6) $4\overline{)3648}$ (7) $6\overline{)248}$ (8) $7\overline{)6379}$

(9) $2\overline{)289}$ (10) $3\overline{)2163}$ (11) $5\overline{)1550}$ (12) $4\overline{)2089}$

(13) $8\overline{)7283}$ (14) $9\overline{)1898}$ (15) $8\overline{)248}$ (16) $7\overline{)4276}$

(17) $2\overline{)1248}$ (18) $5\overline{)3051}$ (19) $6\overline{)1869}$ (20) $4\overline{)2880}$

Process - Short Division
Skill - Carrying with and without remainder

Raw Score_____

Test XXIV
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can do short division. There is carrying in these problems, and some of the examples will have remainders.

Example A

$5\overline{)255}$ = 45

When we divide 225 by 5 the answer is 45 as shown in this example.

Example B

$4\overline{)2204}$

Work this problem before beginning the test.

---

(1) $2\overline{)210}$ (2) $8\overline{)7209}$ (3) $6\overline{)2538}$

(4) $4\overline{)608}$ (5) $7\overline{)2395}$ (6) $8\overline{)776}$

(7) $7\overline{)6576}$ (8) $9\overline{)13572}$ (9) $5\overline{)39526}$

(10) $6\overline{)1568}$ (11) $3\overline{)3018}$ (12) $5\overline{)35065}$

(13) $4\overline{)4019}$ (14) $7\overline{)1267}$ (15) $3\overline{)1787}$

Process - Short Division
Skill - Carrying with and without remainder

Raw Score_____

Test XXIV
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can do short division. There is carrying in these problems, and some of the examples will have remainders.

Example A

$5\overline{)225}$ $\quad 45$

When we divide 225 by 5 the answer is 45 as shown in this example.

Example B

$4\overline{)2204}$

Work this problem before beginning the test.

---

(1) $2\overline{)4564}$ (2) $7\overline{)1698}$ (3) $4\overline{)38503}$

(4) $8\overline{)236}$ (5) $5\overline{)2045}$ (6) $3\overline{)900}$

(7) $9\overline{)768}$ (8) $3\overline{)1384}$ (9) $7\overline{)1260}$

(10) $8\overline{)776}$ (11) $4\overline{)56012}$ (12) $5\overline{)4704}$

(13) $6\overline{)7380}$ (14) $6\overline{)7854}$ (15) $9\overline{)981}$

Process - Short Division
Skill - Carrying with and without remainder

Raw Score_____

Test XXIV
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can do short division. There is carrying in these problems, and some of the examples will have remainders.

Example A

$5\overline{)225}$ $\quad 45$

When we divide 225 by 5 the answer is 45 as shown in this example.

Example B

$4\overline{)2204}$

Work this problem before beginning the test.

---

(1) $8\overline{)290}$ (2) $6\overline{)4237}$ (3) $9\overline{)2073}$

(4) $5\overline{)768}$ (5) $7\overline{)2282}$ (6) $9\overline{)4410}$

(7) $8\overline{)7125}$ (8) $7\overline{)4965}$ (9) $9\overline{)6079}$

(10) $4\overline{)696}$ (11) $8\overline{)3600}$ (12) $7\overline{)3397}$

(13) $2\overline{)7402}$ (14) $6\overline{)5043}$ (15) $3\overline{)2618}$

Process - Short Division
Skill - Carrying with and without remainder

Raw Score_____

Test XXIV
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can do short division. There is carrying in these problems, and some of the examples will have remainders.

Example A

$5\overline{)225}$ = 45

When we divide 225 by 5 the answer is 45 as shown in this example.

Example B

$4\overline{)2204}$

Work this problem before beginning the test.

---

(1) $7\overline{)6134}$ (2) $4\overline{)1584}$ (3) $8\overline{)6339}$

(4) $5\overline{)1934}$ (5) $9\overline{)8678}$ (6) $5\overline{)5632}$

(7) $8\overline{)7176}$ (8) $7\overline{)4146}$ (9) $9\overline{)7488}$

(10) $6\overline{)4419}$ (11) $5\overline{)4770}$ (12) $8\overline{)3680}$

(13) $9\overline{)518}$ (14) $3\overline{)2960}$ (15) $4\overline{)3429}$

THE COMMITTEE'S TEST

LONG DIVISION

Process - Long Division
Skills - Two-place divisor, right hand figure very small, no carrying in the multiplication, no borrowing in the subtraction, no remainders.

Raw Score_____

Test XXV
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There is no carrying, no borrowing, and no remainders in these problems. Be sure to do the very best you can.

Example A

$$21\overline{)231} = 11$$

When we divide 231 by 21 the answer is 11 as shown in this example.

21
21
0

Example B

$12\overline{)288}$

Work this problem before beginning the test.

---

(1) $11\overline{)198}$ (2) $23\overline{)253}$ (3) $13\overline{)299}$

(4) $24\overline{)2664}$ (5) $12\overline{)252}$ (6) $11\overline{)6897}$

(7) $22\overline{)4686}$ (8) $12\overline{)144}$ (9) $41\overline{)45592}$

(10) $11\overline{)7898}$ (11) $31\overline{)9982}$ (12) $11\overline{)671}$

(13) $33\overline{)3696}$ (14) $42\overline{)462}$ (15) $61\overline{)671}$

Process - Long Division
Skills - Two-place divisor, right hand figure very small, no carrying in the multiplication, no borrowing in the subtraction, no remainders.

Raw Score_____

Test XXV
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There is no carrying, no borrowing, and no remainders in these problems. Be sure to do the very best you can.

Example A

$$\begin{array}{r} 11 \\ 21\overline{)231} \\ 21 \\ \hline 21 \\ 21 \\ \hline 0 \end{array}$$

When we divide 231 by 21 the answer is 11 as shown in this example.

Example B

$12\overline{)288}$

Work this proble m before beginning the test.

---

(1) $33\overline{)693}$ (2) $23\overline{)2553}$ (3) $11\overline{)176}$

(4) $42\overline{)8862}$ (5) $12\overline{)132}$ (6) $22\overline{)28864}$

(7) $24\overline{)264}$ (8) $11\overline{)7975}$ (9) $21\overline{)861}$

(10) $61\overline{)6771}$ (11) $13\overline{)273}$ (12) $52\overline{)5772}$

(13) $11\overline{)2563}$ (14) $31\overline{)682}$ (15) $41\overline{)4551}$

Process - Long Division
Skills - Two-place divisor, right hand figure very small, no carrying in the multiplication, no borrowing in the subtraction, no remainders.

Raw Score_____

Test XXV
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There is no carrying, no borrowing, and no remainders in these problems. Be sure to do the very best you can.

Example A

```
     11
21) 231
    21
     21
     21
      0
```

When we divide 231 by 21 the answer is 11 as shown in this example.

Example B

12) 288

Work this problem before beginning the test.

---

(1) 12) 168 (2) 23) 299 (3) 33) 6996

(4) 11) 132 (5) 52) 572 (6) 21) 2394

(7) 62) 6882 (8) 31) 651 (9) 22) 4642

(10) 11) 4994 (11) 13) 273 (12) 41) 49651

(13) 14) 2954 (14) 51) 5661 (15) 11) 5896

Process - Long Division
Skills - Two-place divisor, right hand figure very small, no carrying in the multiplication, no borrowing in the subtraction, no remainders.

Raw Score_____

Test XXV
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There is no carrying, no borrowing, and no remainders in these problems. Be sure to do the best you can.

Example A

```
   11
21)231
   21
   21
   21
    0
```

When we divide 231 by 21 the answer is 11 as shown in this example.

Example B

12)288 Work this problem before beginning the test.

---

(1) 21)882 (2) 11)154 (3) 22)6886

(4) 12)156 (5) 31)9951 (6) 11)8965

(7) 23)276 (8) 11)6897 (9) 42)4662

(10) 13)14456 (11) 51)561 (12) 14)294

(13) 12)1464 (14) 33)6963 (15) 11)7898

Process - Long Division
Skills - Two-place divisor, three or four place dividend, no carrying or borrowing, some remainders.

Raw Score_____

Test XXVI
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There will be no carrying and no borrowing. Some of the problems will have remainders. Be sure to do the very best you can.

Example A

$$\begin{array}{r} 11 \\ 15\overline{)165} \\ 15 \\ \hline 15 \\ 15 \\ \hline 0 \end{array}$$

When we divide 165 by 15 the answer is 11 as shown in this example.

Example B

$41\overline{)8647}$ Work this problem before beginning the test.

---

(1) $14\overline{)299}$ (2) $72\overline{)794}$ (3) $24\overline{)289}$

(4) $23\overline{)4853}$ (5) $44\overline{)496}$ (6) $22\overline{)4688}$

(7) $12\overline{)252}$ (8) $13\overline{)299}$ (9) $12\overline{)1584}$

(10) $22\overline{)2662}$ (11) $30\overline{)3661}$ (12) $33\overline{)3697}$

(13) $43\overline{)4784}$ (14) $81\overline{)898}$ (15) $31\overline{)694}$

Process - Long Division
Skills - Two-place divisor, three or four place dividend, no carrying or borrowing, some remainders.

Raw Score_____

Form B
Test XXVI

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There will be no carrying and no borrowing. Some of the problems will have remainders. Be sure to do the very best you can.

Example A

```
    11
15)165
   15
    15
    15
     0
```

When we divide 165 by 15 the answer is 11 as shown in this example.

Example B

41) 8647

Work this problem before beginning the test.

---

(1) 61)682 (2) 14)1696 (3) 23)497

(4) 31)3756 (5) 42)8894 (6) 50)574

(7) 21)6951 (8) 32)9975 (9) 41)4987

(10) 13)273 (11) 11)488 (12) 31)3456

(13) 22)682 (14) 12)492 (15) 33)693

Process - Long Division
Skills - Two-place divisor, three or four place dividend, no carrying or borrowing, some remainders.

Raw Score_____

Test XXVI
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There will be no carrying and no borrowing. Some of the problems will have remainders. Be sure to do the very best you can.

Example A

$$\begin{array}{r} 11 \\ 15\overline{)165} \\ \underline{15} \\ 15 \\ \underline{15} \\ 0 \end{array}$$

When we divide 165 by 15 the answer is 11 as shown in this example.

Example B

$41\overline{)8647}$

Work this problem before beginning the test.

---

(1) $13\overline{)169}$ (2) $20\overline{)6887}$ (3) $63\overline{)696}$

(4) $32\overline{)9952}$ (5) $32\overline{)352}$ (6) $52\overline{)584}$

(7) $41\overline{)495}$ (8) $22\overline{)2486}$ (9) $11\overline{)489}$

(10) $23\overline{)257}$ (11) $33\overline{)3697}$ (12) $41\overline{)8698}$

(13) $31\overline{)997}$ (14) $10\overline{)1212}$ (15) $21\overline{)462}$

Process - Long Division
Skills - Two-place divisor, three or four place dividend, no carrying or borrowing, some remainders.

Raw Score_____

Test XXVI
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There will be no carrying and no borrowing. Some of the problems will have remainders. Be sure to do the very best you can.

Example A

```
     11
15) 165
    15
     15
     15
      0
```

When we divide 165 by 15 the answer is 11 as shown in this example.

Example B

41) 8647

Work this problem before beginning the test.

---

(1) 32) 6785 (2) 40) 480 (3) 13) 279

(4) 22) 2662 (5) 52) 5776 (6) 10) 1250

(7) 20) 676 (8) 63) 696 (9) 41) 492

(10) 32) 369 (11) 11) 489 (12) 32) 3872

(13) 23) 495 (14) 30) 990 (15) 22) 487

Process - Long Division
Skill - Two figures in divisor, dividend is one figure larger than divisor, no borrowing, no carrying.

Raw Score_____

Test XXVII
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when the first partial dividend requires one more digit than the divisor contains. There is no borrowing, no carrying, but some of the problems will have remainders. Be sure to do the very best you can.

Example A

```
      36
51) 1836
    153
     306
     306
```

When we divide 1836 by 51 the answer is 36 as shown in this example.

Example B

40) 1824

Work this problem before beginning the test.

---

(1) 21)1281 (2) 41)1681 (3) 50)3675 (4) 61)1281

(5) 80)2492 (6) 71)1491 (7) 52)1096 (8) 82)1889

(9) 81)3675 (10) 31)1488 (11) 40)3964 (12) 30)1291

(13) 70)2451 (14) 20)1846 (15) 60)1982 (16) 53)1696

(17) 62)1364 (18) 42)1388 (19) 51)1127 (20) 72)2396

Process - Long Division
Skill - Two figures in divisor, dividend is one figure larger than divisor, no borrowing, no carrying.

Raw Score_____

Test XXVII
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when the first partial dividend requires one more digit than the divisor contains. There is no borrowing, no carrying, but some of the problems will have remainders. Be sure to do the very best you can.

Example A

```
      62  --2R
70) 4342
    420
     142
     140
       2
```

When we divide 4342 by 70 the answer is 62 with 2R as shown in this example.

Example B

54) 1686

Work this problem before beginning the test.

---

(1) 41) 1353 (2) 70) 3938 (3) 53) 1196 (4) 60) 1933

(5) 72) 1594 (6) 52) 1768 (7) 90) 5851 (8) 80) 2642

(9) 21) 1491 (10) 40) 3524 (11) 71) 2485 (12) 62) 1984

(13) 31) 1395 (14) 50) 2652 (15) 61) 1952 (15) 51) 1686

(17) 20) 1724 (18) 42) 1397 (19) 81) 2595 (20) 30) 1652

Process - Long Division
Skill - Two figures in divisor, dividend is one figure larger than divisor, no borrowing, no carrying.

Raw Score_____

Test XXVII
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when the first partial dividend requires one more digit than the divisor contains. There is no borrowing, no carrying, but some of the problems will have remainders. Be sure to do your very best.

Example A

```
    23  --12R
82)1898
   164
    258
    246
     12
```

When we divide 1898 by 32 the answer is 23 with 12R as shown in this example.

Example B

61)1464

Work this problem before beginning the test.

---

(1) 71)2988 (2) 52)2184 (3) 61)2684 (4) 21)1785

(5) 50)2424 (6) 82)2799 (7) 90)2886 (8) 70)1897

(9) 41)2255 (10) 31)1679 (11) 60)3242 (12) 42)1386

(13) 53)1698 (14) 72)2388 (15) 81)4293 (16) 51)1785

(17) 30)1983 (18) 40)2646 (19) 62)1488 (20) 80)4423

Process - Long Division
Skill - Two figures in divisor, dividend is one figure larger than divisor, no borrowing, no carrying.

Raw Score_____

Test XXVII
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when the first partial dividend requires one more digit than the divisor contains. There is no borrowing, no carrying, but some of the problems will have remainders. Be sure to do the very best you can.

Example A

```
    65  --12R
30)1962
   180
    162
    150
     12
```

When we divide 1962 by 30 the answer is 65 with 12R as shown in this example.

Example B

71) 3763

Work this problem before beginning the test.

---

(1) 71) 4686 (2) 82) 2788 (3) 20) 1989 (4) 51) 2244

(5) 52) 2289 (6) 62) 1369 (7) 31) 1984 (8) 81) 1944

(9) 60) 2768 (10) 90) 3963 (11) 53) 1167 (12) 42) 1399

(13) 70) 4628 (14) 72) 1656 (15) 30) 2264 (16) 21) 1176

(17) 80) 3524 (18) 61) 3294 (19) 50) 3153 (20) 41) 3485

Process - Long Division
Skill - Larger right hand figure in the divisor, carrying in the multiplication, some remainders

Raw Score_____

Test XXVIII
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when there is carrying in the multiplication. Some problems will have remainders. Be sure to do the very best you can.

Example A

```
     5  --18R
28) 158  When we divide 158 by 28
   140   the answer is 5 with 18R
    18   as shown in this example.
```

Example B

19) 7999 Work this problem before beginning the test.

---

(1) 46) 1978 (2) 57) 1379 (3) 85) 2997

(4) 33) 1787 (5) 76) 988 (6) 65) 4687

(7) 38) 798 (8) 68) 884 (9) 78) 3354

(10) 97) 3997 (11) 39) 897 (12) 49) 1098

(13) 67) 4154 (14) 84) 1092 (15) 55) 2446

Process - Long Division
Skill - Larger right hand figure in the divisor, carrying in the multiplication, some remainders

Raw Score_____

Test XXVIII
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when there is carrying in the multiplication. Some problems will have remainders. Be sure to do the very best you can.

Example A

```
      5   --18R
28) 158   When we divide 158 by 28
   140   the answer is 5 with 18R
    18   as shown in this example.
```

Example B

19) 7999 Work this problem before beginning the test.

---

(1) 66) 2981 (2) 75) 1650 (3) 34) 1196

(4) 25) 550 (5) 45) 959 (6) 83) 4492

(7) 47) 997 (8) 56) 1792 (9) 35) 878

(10) 84) 2788 (11) 58) 2494 (12) 74) 2298

(13) 56) 4189 (15) 95) 3897 (15) 36) 792

Process - Long Division
Skill - Larger right hand figure in the divisor, carrying in the multiplication, some remainders.

Raw Score_____

Test XXVIII
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when there is carrying in the multiplication. Some problems will have remainders. Be sure to do the very best you can.

Example A

```
     5   --18R
28) 158  When we divide 158 by 28
   140   the answer is 5 with 18R
    18   as shown in this example
```

Example B

19) 7999 Work this problem before beginning the test.

---

(1) 37) 777 (2) 74) 2368 (3) 94) 4982

(4) 79) 2683 (5) 54) 2754 (6) 96) 4896

(7) 28) 588 (8) 64) 1984 (9) 73) 4599

(10) 55) 2446 (11) 43) 1978 (12) 35) 1085

(13) 64) 3968 (14) 23) 953 (15) 36) 864

Process - Long Division
Skill - Larger right hand figure in the divisor, carrying in the multiplication, some remainders

Raw Score_____

Test XXVIII
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Direction to Pupils: This is a test to see how well you can divide when there is carrying in the multiplication. Some problems will have remainders. Be sure to do the very best you can.

Example A

```
    5
28)158
  140
   18
```

--18R

When we divide 158 by 28 the answer is 5 with 18R as shown in this example.

Example B

19)7999

Work this problem before beginning the test.

---

(1) 45)995 (2) 86)4472 (3) 89)8099

(4) 59)5369 (5) 63)4599 (6) 35)1195

(7) 26)598 (8) 53)4983 (9) 64)3399

(10) 23)999 (11) 54)4492 (12) 75)2475

(13) 77)2464 (14) 98)4998 (15) 87)4785

Process - Long Division Raw Score_____
Skill - Borrowing in the Subtraction,
no carrying in the multiplication.
Carrying in the multiplication
and borrowing in the subtraction.
Easy examples with more than two
figures in the divisor.

Test XXIX
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There is carrying in the multiplication, and borrowing in the subtraction. Be sure to do the very best you can.

Example A

```
   22  --8R
14)316
   28
    36
    28
     8
```

When we divide 316 by 14 the answer is 22 with 8R as shown in this example.

Example B

63)7864

Work this problem before beginning the test.

---

(1) 42)1402 (2) 85)4105 (3) 32)1376 (4) 64)4104

(5) 58)1419 (6) 221)9362 (7) 91)5152 (8) 73)6132

(9) 62)1992 (10) 45)1952 (11) 131)2751 (12) 35)1942

(13) 54)3618 (14) 24)873 (15) 95)4565 (16) 23)495

(17) 81)7866 (18) 51)3242 (19) 82)2797 (20) 94)5822

Process - Long Division
Skill - Borrowing in the subtraction, no carrying in the multiplication. Carrying in the multiplication and borrowing in the subtraction. Easy examples with more than two figures in the divisor.

Raw Score_____

Test XXIX
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There is carrying in the multiplication, and borrowing in the subtraction. Be sure to do the very best you can.

Example A

```
    22  --8R
14)316  When we divide 316 by 14
   28   the answer is 22 with 8R
    36  as shown in this example.
    28
     8
```

Example B

63) 7864 Work this problem before beginning the test.

---

(1) 56) 1844 (2) 32) 1058 (3) 74) 2137 (4) 83) 2673

(5) 45) 20925 (6) 76) 8512 (7) 107) 7062 (8) 51) 2435

(9) 34) 1428 (10) 73) 6420 (11) 61) 2539 (12) 33) 9546

(13) 83) 7211 (14) 62) 2046 (15) 53) 1219 (16) 41) 1886

(17) 92) 1232 (18) 456) 77064 (19) 29) 2418 (20) 53) 1651

Process - Long Division
Skill - Borrowing in the subtraction,
no carrying in the multiplication.
Carrying in the multiplication
and borrowing in the subtraction.
Easy examples with more than two
figures in the divisor.

Raw Score_____

Test XXIX
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There is carrying in the multiplication, and borrowing in the subtraction. Be sure to do the very best you can.

Example A

```
   22   --8R
14)316  When we divide 316 by 14
   28   the answer is 22 with 8R
    36  as shown in this example.
    28
     8
```

Example B

63)7864 Work this problem before beginning the test.

---

(1) 21)1617 (2) 73)3076 (3) 52)1754 (4) 63)4103

(5) 43)1281 (6) 32)1158 (7) 44)5332 (8) 82)2204

(9) 54)3672 (10) 231)5584 (11) 36)3024 (12) 96)3176

(13) 81)6836 (14) 41)1933 (15) 93)2989 (16) 52)38168

(17) 22)1723 (18) 320)116480 (19) 75)5512 (20) 21)1415

Process - Long Division Raw Score_____
Skill - Borrowing in the subtraction,
no carrying in the multiplication.
Carrying in the multiplication
and borrowing in the subtraction.
Easy examples with more than two
figures in the divisor.

Test XXIX
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide. There is carrying in the multiplication, and borrowing in the subtraction. Be sure to do the very best you can.

Example A

```
   22   --8R
14)316
   28
    36
    28
     8
```

When we divide 316 by 14 the answer is 22 with 8R as shown in this example.

Example B

63)7864 Work this problem before beginning the test.

---

(1) 53)1651 (2) 78)4368 (3) 65)5265 (4) 34)2491

(5) 113)4633 (6) 94)1974 (7) 31)1744 (8) 63)1395

(9) 95)5102 (10) 21)1953 (11) 82)2797 (12) 71)2523

(13) 52)39268 (14) 81)7869 (15) 41)2995 (16) 56)1402

(17) 61)5191 (18) 23)1302 (19) 216)24840 (20) 48)1284

Process - Long Division
Skill - Zero in the Dividend

Raw Score_____

Test XXX
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when there are zeros in the dividend. Be sure to do the very best you can.

Example A

```
    15  --13R
33)508
   33
   178
   165
    13
```

When we divide 508 by 33 the answer is 15 with 13R as shown in this example.

Example B

24)73680 Work this problem before beginning the test.

---

(1) 45)720 (2) 86)10080 (3) 225)5850

(4) 79)4504 (5) 485)151060 (6) 82)56020

(7) 21)1092 (8) 54)19008 (9) 67)34909

(10) 314)11460 (11) 95)30020 (12) 24)5550

(13) 65)2210 (14) 33)1056 (15) 735)91100

Process - Long Division
Skill - Zero in the Dividend

Raw Score_____

Test XXX
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when there are zeros in the dividend. Be sure to do the best you can.

Example A

```
    15
33)508
   33
   178
   165
    13
```

--13R

When we divide 508 by 33 the answer is 15 with 13R as shown in this example.

Example B

24) 73680

Work this problem before beginning the test.

---

(1) 56)29802 (2) 22)15906 (3) 623)27004

(4) 79)2502 (5) 432)93020 (6) 92)35070

(7) 562)14050 (8) 38)16003 (9) 75)62400

(10) 63)15908 (11) 215)50603 (12) 42)6006

(13) 88)37400 (14) 23)720 (15) 99)2079

Process - Long Division
Skill - Zero in the Dividend

Raw Score_____

Test XXX
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when there are zeros in the dividend. Be sure to do the very best you can.

Example A

```
      15
33) 508
    33
    178
    165
     13
```

--13R

When we divide 508 by 33 the answer is 15 with 13R as shown in this example.

Example B

24) 73680

Work this problem before beginning the test.

---

(1) 59) 14290 (2) 76) 62800 (3) 325) 29900

(4) 85) 39530 (5) 43) 23091 (6) 524) 447800

(7) 87) 12407 (8) 67) 41880 (9) 92) 20056

(10) 427) 232090 (11) 53) 39909 (12) 72) 68280

(13) 28) 5908 (14) 235) 99405 (15) 95) 60325

Process - Long Division
Skill - Zero in the Dividend

Raw Score_____

Test XXX
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when there are zeros in the dividend. Be sure to do the very best you can.

Example A

```
     15  --13R
33) 508
    33
    178
    165
     13
```

When we divide 508 by 33 the answer is 15 with 13R as shown in this example.

Example B

24) 73680

Work this problem before beginning the test.

---

(1) 41) 31000

(2) 74) 69006

(3) 35) 17990

(4) 412) 353084

(5) 68) 29990

(6) 76) 48908

(7) 624) 599800

(8) 43) 35520

(9) 54) 39096

(10) 83) 55900

(11) 64) 28990

(12) 332) 239900

(13) 93) 80690

(14) 86) 46096

(15) 522) 499032

Process - Long Division
Skill - Zero in the Quotient

Raw Score_____

Test XXXI
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you divide when the quotient will have a zero in it. Be sure to do the very best you can.

Example A

```
    101
44)4444
   44
    44
    44
```

When we divide 4444 by 44 the answer is 101 as shown in this example.

Example B

81) 16848

Work this problem before beginning the test.

---

(1) 60)18240 (2) 23)92115 (3) 73)18980

(4) 451)22550 (5) 86)516797 (6) 20)12180

(7) 98)68600 (8) 75)225678 (9) 829)66320

(10) 80)164000 (11) 56)392449 (12) 246)4920

(13) 94)60160 (14) 40)32280 (15) 31)26970

Process - Long Division
Skill - Zero in the Quotient

Raw Score_____

Test XXXI
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when the quotient will have a zero in it. Be sure to do the very best you can.

Example A

```
    101
44)4444
   44
    44
    44
```

When we divide 4444 by 44 the answer is 101 as shown in this example.

Example B

81) 16848

Work this problem before beginning the test.

---

(1) 64)41600 (2) 30)12210 (3) 529)31740

(4) 31)28520 (5) 42)31080 (6) 50)10300

(7) 95)665190 (8) 40)123600 (9) 89)73892

(10) 20)10168 (11) 307)24560 (12) 83)415498

(13) 76)304621 (14) 981)39240 (15) 77)462540

Process - Long Division
Skill - Zero in the Quotient

Raw Score_____

Test XXXI
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when the quotient will have a zero in it. Be sure to do the very best you can.

Example A

```
     101
44) 4444
    44
      44
      44
```

When we divide 4444 by 44 the answer is 101 as shown in this example.

Example B

81) 16848

Work this problem before beginning the test.

---

(1) 73) 511219 (2) 50) 153500 (3) 805) 32200

(4) 96) 192864 (5) 410) 32800 (6) 70) 42630

(7) 61) 24620 (8) 58) 11716 (9) 90) 36540

(10) 56) 33600 (11) 62) 35971 (12) 30) 27060

(13) 83) 415664 (14) 324) 207360 (15) 92) 644108

Process - Long Division
Skill - Zero in the Quotient

Raw Score_____

Test XXXI
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when the quotient will have a zero in it. Be sure to do the very best you can.

Example A

```
   101
44)4444
   44
    44
    44
```

When we divide 4444 by 44 the answer is 101 as shown in this example.

Example B

81) 16848

Work this problem before beginning the test.

---

(1) 78) 156624 (2) 30) 180900 (3) 95) 570475

(4) 426) 34090 (5) 85) 765255 (6) 50) 5400

(7) 52) 37960 (8) 78) 49925 (9) 46) 18630

(10) 32) 5760 (11) 40) 28212 (12) 63) 378441

(13) 245) 29600 (14) 309) 21630 (15) 20) 8180

Process - Long Division
Skill - When Trial Quotient is not True Quotient

Raw Score_____

Test XXXII
Form A

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when the trial quotient is not always the true quotient. Be sure to do the very best you can.

Example A

```
     29  --17R
63) 1844
    126
     584
     567
      17
```

When we divide 1844 by 63 the answer is 29 with 17R as shown in this example.

Example B

39) 3146

Work this problem before beginning the test.

---

(1) 13) 6747 (2) 77) 1526 (3) 35) 927

(4) 26) 1503 (5) 94) 2703 (6) 48) 816

(7) 19) 310 (8) 38) 684 (9) 15) 2683

(10) 47) 4418 (11) 88) 167 (12) 29) 851

(13) 68) 1903 (14) 26) 756 (15) 54) 155

Process - Long Division
Skill - When Trial Quotient is not True Quotient

Raw Score_____

Test XXXII
Form B

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when the trial quotient is not always the true quotient. Be sure to do the very best you can.

Example A

```
      29  --17R
63) 1844
    126
     584
     567
      17
```

When we divide 1844 by 63 the answer is 29 with 17R as shown in this example.

Example B

39) 3146

Work this problem before beginning the test.

---

(1) 19) 3534 (2) 67) 1228 (3) 34) 918

(4) 25) 4800 (5) 85) 3315 (6) 49) 910

(7) 37) 7289 (8) 94) 2703 (9) 76) 298

(10) 29) 120 (11) 46) 8871 (12) 64) 492

(13) 54) 1026 (14) 16) 448 (15) 36) 158

Process - Long Division
Skill - When Trial Quotient is not True Quotient

Raw Score_____

Test XXXII
Form C

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when the trial quotient is not always the true quotient. Be sure to do the very best you can.

Example A

```
      29  --17R
63) 1844
    126
     584
     567
      17
```

When we divide 1844 by 63 the answer is 29 with 17R as shown in this example.

Example B

39) 3146

Work this problem before beginning the test.

---

(1) 28) 837 (2) 49) 871 (3) 88) 2182

(4) 59) 1071 (5) 56) 270 (6) 37) 1650

(7) 47) 5902 (8) 68) 563 (9) 49) 350

(10) 18) 4200 (11) 49) 3602 (12) 56) 4423

(13) 67) 2198 (14) 77) 4501 (15) 29) 927

Process - Long Division
Skill - When Trial Quotient is not True Quotient

Raw Score_____

Test XXXII
Form D

OMAHA PUBLIC SCHOOLS
Pupil Diagnosis
Arithmetic

Name_____Grade_____Date_____

Directions to Pupils: This is a test to see how well you can divide when the trial quotient is not always the true quotient. Be sure to do the very best you can.

Example A

$$\begin{array}{r} 29 \text{ --17R} \\ 63\overline{)1844} \\ \underline{126} \\ 584 \\ \underline{567} \\ 17 \end{array}$$

When we divide 1844 by 63 the answer is 29 with 17R as shown in this example.

Example B

$39\overline{)3146}$

Work this problem before beginning the test.

---

(1) $66\overline{)560}$ (2) $78\overline{)4823}$ (3) $97\overline{)4821}$

(4) $69\overline{)500}$ (5) $28\overline{)2738}$ (6) $39\overline{)1235}$

(7) $28\overline{)152}$ (8) $28\overline{)9769}$ (9) $27\overline{)6090}$

(10) $48\overline{)1580}$ (11) $36\overline{)130}$ (12) $68\overline{)285}$

(13) $29\overline{)9604}$ (14) $29\overline{)6015}$ (15) $48\overline{)352}$